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By

KENELM WINSLOW, B.A.S., M.D.

*Formerly Assistant Professor Comparative Therapeutics, Harvard University; Late Surgeon to the Newton Hospital;
Fellow of the Massachusetts Medical Society, etc.*

With the Coöperation of Many Medical
Advising Editors and Special Contributors

IN SIX VOLUMES

*First Aid :: Family Medicines :: Nose, Throat, Lungs,
Eye, and Ear :: Stomach and Bowels :: Tumors and
Skin Diseases :: Rheumatism :: Germ Diseases
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1910

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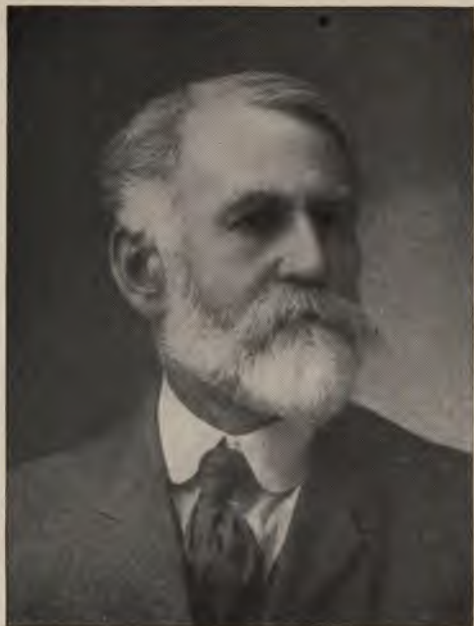
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Volume IV

PERSONAL HYGIENE

FAMILY MEDICINES

By KENELM WINSLOW, B.A.S., M.D. (Harv.)

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EXERCISE

By DUDLEY ALLEN SARGENT, A.M., Sc.D., M.D.

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PRACTICAL KITCHEN SCIENCE

By JANET MCKENZIE HILL

Editor Boston Cooking School Magazine; Author "Practical Cooking and Serving," "Salads, Sandwiches, and Chafing-Dish Dainties," etc.

NEW YORK

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Part I

PERSONAL HYGIENE

BY

KENELM WINSLOW

CHAPTER I

Skin; Hair; Clothing

BATHING.—Baths are useful for various purposes. Cleanliness requires that the ordinary person should bathe at least twice a week. Dead, scaly particles of skin, fatty secretions of the skin, dirt and sweat—interfering with the proper action of the skin in eliminating waste matters—are thus removed, and the kidneys are relieved of performing extra work in carrying off the waste substances from the blood, which is forced upon them when the pores of the skin are clogged and irritated by dirt. Clogged pores lead to skin eruptions. The cold bath (temperature 40° to 75° F.) has a very powerful stimulating action on the circulation and nervous system, in addition to cleansing functions. How powerful this is may be realized when one appreciates that throwing cold water on the chest has often more effect in restoring consciousness, by exciting the action of the heart and of the diaphragm, than any other remedy. The cold-bath habit is common among the better classes in England and America; and ruddiness, fine complexions, and robustness are in no small part due to the custom. The

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daily cold bath should be taken on rising by everyone having the facilities and able to secure the afterglow or reaction which should always follow if the bath agrees. The cold shower or sponge bath can be employed when the tub bath is not feasible. For many persons unable to take the cold bath without feeling chilly afterwards, and for children, the use of hot water to sit or stand in while taking a cold shower or sponging will often prevent undue shock. Persons unaccustomed to cold baths should begin to take them in summer and so continue them throughout the year. They are very valuable for many of those who think them impossible; namely, those who take cold readily and frequently, those below par and needing tone. The cold should be applied to the skin only for a minute or two and brisk rubbing with a coarse towel should follow. For young children, old persons unaccustomed to cold water, and those with weak hearts, for women who are "unwell" or in the latter months of pregnancy, cold baths are inadvisable. Also cold baths are harmful to persons fatigued with muscular exertion and to those excessively hot, but may be taken by healthy persons when warm with moderate exercise. Cold baths should be taken before breakfast or at least three hours after eating.

Outdoor Bathing.—The pure air, the exercise, the sunlight, the stimulating effect of the waves and salt (in sea water), and, in addition, the pleasure, make this form of cold bath (usually from 60° to 75° F.)

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particularly health-giving. It is very often, however, grossly misused. The effect of remaining in cold water for a considerable time causes an immense loss of body heat and consequent drain upon the vitality. This is shown by the tremendous fall of temperature brought about by the cold baths employed by physicians in the treatment of fevers and sunstroke in which the patients remain no longer, and often in water no colder than in sea baths taken for pleasure. The remark is often made that sea bathing is exhausting by those who stay in cold water too long. This applies especially to children, who have the pernicious habit of alternately playing out of the water while clothed in wet bathing suits (when evaporation from the skin is constantly cooling them), and occasionally returning into the water; or wading with the bare feet in cold water while their bare heads are exposed to the burning sun—a combination that favors sunstroke. Fat people can often stay in cold water for some time without ill effect. The length of time which it is safe to stay in the water depends entirely on its temperature—anywhere from two to twenty minutes. The former is too long in many parts of the northern New England and Pacific coasts, whereas the latter is only too short in many of the shallow waters of Cape Cod and the middle Atlantic coast. The stay should never be so long as to cause blueness of the lips and fingers, chattering teeth, or chilliness afterwards. The head should always be wet before plunging into cold water,

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either by diving or dipping the head. It is unwise to enter cold water when one is excessively hot. It is safer, however, to bathe when moderately warm than when beginning to cool after exercise. Those accustomed to cold water may bathe before breakfast to advantage; others should wait until three hours after this meal or for the same period after other meals. Immersing the whole body in cold water at first drives the blood from the skin into the internal organs and to the head, if it is not wet, and disturbs the ordinary, even distribution of the blood throughout the body. After eating, more blood goes to the stomach than usual and agencies still further altering the distribution of blood—as cold bathing—may work harm. It is said by good authorities that sudden deaths have occurred in bathers entering cold water soon after eating. This may happen because still more blood is driven inward through the effect of cold on the skin, and it is possible that so much leaves the head as to cause fainting. However it may be, it is inconceivable that harm results from withdrawal of blood from the stomach—the reason commonly assigned. Sudden and unexpected deaths among bathers and swimmers are frequently due to either special weakness of the heart or overexertion. The dangers of “cramps” are probably much magnified. There is no more violent exercise than rapid swimming in rough water, and great strain is wrought on even the healthy heart in those who are not in training. Then again the nervous

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shock of a sudden plunge into cold water is sufficient immediately to stop the action of a weak heart and result in unconsciousness and drowning unless help is at hand. Those who are subject to fainting, palpitation, or known disturbance of the heart, and the elderly not habituated to cold water, should refrain from bathing out of doors, as also those likely to suffer injury from cold baths, as stated.

Indoor Bathing. *The Tepid or Lukewarm Bath* (80° to 90° F.)—This has no special effect apart from cleansing. It is suitable for invalids, the elderly, convalescents, and those who do not react well to cold baths. It may be taken at any time of day, but preferably before meals and at bedtime.

The Warm Bath (90° to 100° F.)—This is the appropriate one for infants; and to prevent sleeplessness in adults when taken just before bedtime. It also is excellent after severe muscular exercise to relieve soreness and stiffness of joints and muscles. It should not be employed until two or three hours have elapsed after meals, as blood may be drawn away from the stomach with resulting digestive disturbances. It is unwise for the bather to venture into the cold air immediately after a warm bath.

The Hot Bath (105° to 110° F.)—The hot bath is unsuitable, except for the strong, as it is depressing to the circulation. It should only be used at night, or when the bather is to stay in a warm atmosphere, and not after meals. At bedtime the hot bath may, how-

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ever, cause sleeplessness unless a cold cloth is kept on the head during the bath. The hot bath is very valuable in preventing colds after exposure and chilling, and to produce sweating in many disorders to which reference is made in other sections.

The Turkish Bath consists of a hot-air bath (120° to 170° F.) for ten to thirty minutes, followed by a hot shower bath, then shampooing and general massage in moist air (100° to 110° F.), and finally by a warm shower bath—changing to cold—with thorough rubbing and drying and rest for half an hour in blankets. In the Russian bath moist, instead of dry, air is used in the beginning, which is more oppressive. Turkish and Russian baths are unsafe for persons with a weak heart or those who are very fat. They are of worth in the first stage of a cold, but the patient must not be exposed to the cold air afterwards or there will be decided danger of bronchitis or other pulmonary troubles. Muscular or joint stiffness, following severe physical exertion, and some forms of rheumatism, are much benefited by the Turkish bath.

THE COMPLEXION.—Cold water is better than warm for the complexion, and for the skin in other parts of the body. It improves the tone of the skin of the face, gives color, and prevents wrinkles. The countless toilet preparations made for application to the face may afford some pleasure and employment to the users, but a few simple medicaments will suffice. Rice powder may be applied to the face in warm

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weather, and cold cream or equal parts of glycerine and rose water in cold weather, when the skin is dry and rough. (For special treatment of freckles, tanning, chapping, etc., see Vol. II, p. 150.)

The habitual use of soap on the face is not advisable except in the case of oily skins or a soiled face. There is a vast deal of nonsense in the popular idea that great care must be exercised in the selection of a toilet soap. One toilet soap is about as good as another as far as any special beneficial or injurious action of either on the skin is concerned. Soaps are made from various kinds of fat boiled with an alkali. The cheaper grades of soaps, as the yellow laundry variety, contain an excess of alkali and are therefore more useful in removing grease from textile fabrics, but are harmful in causing drying and roughness of the skin for this reason. Soaps are generally useful in that their lather mechanically mixes with dirt, while the contained alkali dissolves grease, and water washes all away. The more expensive soaps have little or almost no excess of alkali, and one is about as serviceable as another. Plain Castile soap is the simplest of these. Medicated soaps have little value, since any drug contained in them remains in contact with the skin for so short a time.

THE HAIR.—Baldness is produced by wearing close-fitting, ill-ventilated hats; by deficient blood supply to the hair, resulting from a tight-fitting scalp; and the disease of which excessive dandruff is the principal

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sign. The best mode of treating it is by infrequent shampooing, by massage that does not tangle and break the hair, and gentle brushing as described in detail under Dandruff and Baldness (Vol. II, p. 167). Most pomades and hair tonics are of no value. Several skin diseases, caused by parasites, may be conveyed by barbers to their customers by means of their instruments, hands, or towels, etc.

Among these are barber's itch, ringworm, boils, and even carbuncle. The only way to avoid such accidents, with certainty, is for the patron to furnish his own brush and comb, shaving soap, cup, and brush, and see to it that the barber cleanses his scissors and razor with alcohol and water and uses a clean towel.

The finger nails should be trimmed so as to follow in outline the contour of the finger tips; while the toe nails should be cut straight across to avoid pressure on them by the toe of the boot.

CLOTHING.—In regard to underclothes, there are two factors of chief importance. First, the property of retaining body heat. Of the three fabrics most frequently used for clothing, wool is the greatest nonconductor and therefore retains heat most effectually. Impervious materials, as rubber, leather, and Mackintosh, retain heat, but are unsuitable because of affording poor ventilation and are, of course, unfit for underclothing, and even as outside clothes are inadvisable except as a protection against wind and wet when

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one is not taking sufficient exercise to cause much perspiration.

Second, the power of absorbing moisture. Wool possesses the property of rapid and free absorption, but gives out the moisture slowly. Cotton, on the other hand, does not absorb moisture so readily and cools the body much more when wet. Linen is about on a par with cotton as regards power of absorption of moisture and retention of body heat. Wool is thus the best material for underclothing, but is so irritating to the skin of some persons that it cannot be tolerated. To overcome this, merino or mixtures of wool and cotton may be worn. As the property of retaining body heat is largely due to the air spaces in wool and fur, it is found that the cotton fabrics woven loosely with large meshes—something like netting—will to a considerable degree take the place of wool. Wool also shrinks and becomes matted together after a while, like felt, by continuous washing. If the washing is done in tepid water without much rubbing and wringing, but with rinsing, the shrinking will be in a measure avoided. For those subject to rheumatism, or Bright's disease, and in those perspiring freely, woollen underclothes the year round are most desirable. Linen undergarments are much more expensive than cotton but will endure more washing. The linen mesh makes an excellent fabric for warm weather, for it imparts a sense of coolness not felt in cotton.

Undergarments dyed in bright hues are most un-

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desirable, as the aniline colors used often irritate the skin and produce eruptions. The same effect is sometimes caused by colored stockings. The stockings should be changed frequently, especially if the feet perspire freely. If so, the feet should be soaked in hot water and then dusted over with pure boric acid every day. The same treatment is appropriate for excessive perspiration of the hands. Dampness of the underclothing from perspiration favors the growth and development of disease germs and skin parasites, so that clothes should either be changed when wet, or well aired and dried when they are removed. In regard to color of the outer clothes—this is of some importance. Black or dark shades absorb the heat rays of the sun much more than white fabrics or those approaching white in hue. For this reason white clothes are worn in the tropics and in hot weather. The amount of clothing worn should depend upon the temperature. While heavy underclothing is needful for those living out of doors in cold weather, it may be unwise for those spending most of their time indoors in a practically summer temperature during the winter; and many people acquire colds by so doing. The proper way is to dress as in summer while in the house, but very warmly with ulsters, furs, etc., before going into the cold.

FOOT GEAR.—Hats should not fit, but shoes should. A hat made to fit the head is undesirable in obstructing the circulation, but a shoe should be made

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to order from an outline drawn of the stockinged feet to secure the best result. Shoes should generally be almost an inch longer than the foot; the toe should be neither pointed nor absolutely square, and the sole should be nearly flat on the bottom and not turned up from the ground like the section of a rocker. The heels should be low. Extension of the soles outward around the uppers affords better support for the foot and pleases some people.

CHAPTER II

Digestion

HYGIENE OF THE DIGESTION.—Digestion should begin in the mouth. The food should be chewed thoroughly, not only that when finely divided it is more readily mixed with the digestive juices, but because it is in this way more thoroughly combined with the saliva, which in part digests the cooked, starchy elements of the food. The state of the teeth is, therefore, important. Decay or loss of teeth are frequent causes of indigestion. Decay of the teeth is brought about chiefly by the action of germs in the mouth, very many varieties of which are said to inhabit this cavity. Disease of the gums, resulting in their shrinkage, in matter forming between them and the teeth, and in loosening of the latter—Rigg's disease—is occasioned by the same agency. To obviate decay of the teeth and disease of the gums thorough cleansing is essential. The teeth should be brushed after each meal and tooth powder should be used containing some mild germ destroyer, as oil of wintergreen, boric acid, etc. At night it is well to rinse the mouth with some harmless antiseptic wash, as alcohol diluted with an equal

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part of rose water. In addition, the spaces between the teeth should be cleared by the use of dental floss and the surface enamel occasionally rubbed with tooth powder and a soft blunt-ended stick. The use of sharp, hard toothpicks tends to cause disease of the gums. Irregularities of the teeth may be avoided by removal of teeth in overcrowding, and in preventing the habit of sucking the thumb in babies, and attending to the condition known as mouth breathing, seen so commonly in children.

A faulty mode of life is probably more often the cause of indigestion than of any other disorder. Among the more frequent causes of dyspepsia are rapid eating and insufficient chewing of the food; eating alone; worry, or mental or physical exertion to the point of fatigue; anything which disturbs the happiness or equanimity of mind either during or immediately before or after meals; unpalatable or improperly cooked food; the abuse of alcohol, tea, coffee, or tobacco; rich and indigestible foods, much pastry, fried food, candy; lack of exercise, faulty mode of dress in women; overwork or want of occupation; irregularity in the hours of eating; loss of sleep, and dissipation. Certain disorders favor dyspepsia, as eye strain (which see), loss and decay of teeth, nervous debility, anæmia, and diseases of the heart, liver, kidneys, etc.

When the food reaches the stomach the starchy matter continues to be acted upon for a while, but

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after half an hour or more enough of the acid digestive juice of the stomach is poured out to stop the action of the saliva, and the true stomach digestion of what are called the proteids of the food begins. In the meantime, the stomach is continually contracting in wavelike movements, which mixes the food well with the digestive juice and forces it, a little at a time, onward into the bowel, where the most important part of digestion occurs. Very hot and very cold food lessen the activity and digestive power of the juices (this applies as well to liquids as solids), and if the food is not well chewed the lumps irritate the stomach, and the juices only act on the surface of the food. Much the same happens with food which is fried or *sautéd*. Frying for a long while—in a frying pan—causes the food to become hard and tough and to be saturated with grease, so that the digestive juices have about as much effect upon such food as has water upon a well-greased boot. The proper method of frying consists in immersing the food in boiling fat in a kettle. The temperature is so high that the fat immediately hardens the surface of the article and this, together with the formation of steam from the moisture inside of the food, tends to keep the fat from entering and saturating it.

Into the bowel¹—and but a few inches from the point where it leaves the stomach—enter through a common tube or duct the secretions of the liver and

¹ See frontispiece, Vol. III.—EDITOR.

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pancreas, and these, known as the bile and pancreatic juice, together with the secretion from the walls of the intestines, complete digestion. That intestinal digestion is much more important than that of the stomach is shown by the comparative health in which persons live after removal of the stomach. Also while only starchy matter is partially digested by the saliva and only the proteid element is partially digested by the stomach, the intestinal juices are capable of digesting all the elements contained in food. By digestion is meant a change brought about by both mechanical, chemical, and vital action, whereby the food is disintegrated and rendered fluid, and the insoluble part so altered in chemical nature as to become soluble and therefore capable of being absorbed into the blood through the walls of the intestines. A substance taken as food is just as much outside the body when it is in the stomach or bowels as it would be on the skin—as far as its having any nutritive value is concerned—unless it be so changed by digestion that it is capable of being absorbed into the blood and assimilated by the cells of the body so as to make tissue or give rise to heat and energy.

The essential elements of food comprise the proteids, the carbohydrates, the fats, the salts, and water. Any single food or combination of foods containing all these in the right proportion may be regarded as complete; that is, could be subsisted on indefinitely. Milk comes perhaps nearest to such requirements in a

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single food. The cream represents fat; the casein, which is the chief substance of the curd in sour, skimmed milk, is a proteid, and the sugar of milk is a carbohydrate. Proteids form a large part of the nutritious matter in meat, fish, milk, eggs, and in certain vegetables; as the cereals, especially oatmeal; also in peas and beans. The value of proteids lies in building up tissue, as it constantly is consumed in the vital processes, and to supply new tissue in the growing individual. Proteids also yield heat and energy by their destruction in the body—but this is the rôle played chiefly by carbohydrates—and they also may form fat in the body.

Proteids are generally the most expensive food elements, especially in the very digestible and concentrated form in which they exist in animal food. The animal foods represent the essence of nutriment which has been extracted from vegetables. Lean beef contains as much as seventy-five per cent of water, but the rest of the meat is practically all protein. Beef is the most nourishing meat, but is said not to be quite so digestible as mutton. The strong flavor of the latter makes it unpalatable as a continuous diet. Neither very pale nor dark beef are desirable; the former has not been hung sufficiently long; the latter has not been properly bled, or came from an animal which was ill. Beef well streaked with white fat is much better eating and appears juicier, although fat beef contains considerably less water (fifty-five per cent) than lean beef. Veal

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is as digestible, though slightly less nutritious than beef, lamb, or mutton. If very pale and soft it is too young (under a month), or if only pale, the animal was probably bled to death. A marked distinction between the effect of dark and light meat of poultry and game has been made by physicians in the past in the way of allowing light meat in certain diseases, as gout and rheumatism, while forbidding the use of dark meat. Recent experiments have shown that any differences which exist are so slight as to be unappreciable in their effect upon the body. Meat contains substances which act as stimulants; that is, which excite the heart and nervous activities and do not supply energy, but call upon that already stored in the system. They act like alcohol—as a whip to the tired animal. These substances are called extractives, such as exist in meat extracts and in beef tea and clear soup. They are useful to bridge over critical periods when much nourishment is not possible, or to stimulate appetite; but they possess very slight food value. Fish is wanting in these stimulating bodies, but contains an appreciable quantity of phosphorous, which may be of benefit in conditions of nervous weakness. Fish with white meat is more digestible than that having red flesh, as salmon. Shellfish, as crabs and lobsters, are not infrequently poisonous to some people, causing digestive disturbances and nettle rash or other eruptions. They should be very fresh, as also should clams and oysters. The latter have been sources of typhoid fever

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when grown in water contaminated with sewage containing germs of this disease (see *Poisoning by Shellfish*, Vol. I). Pork contains much nutriment, especially in the form of fat, but is difficult of digestion and is more suitable for those living out of doors. Unless thoroughly cooked it may communicate the parasites trichinæ and tapeworm to man. In regard to the relative value of meat it may be said that it is the most concentrated form of digestible diet (including eggs), and, as we have noted, is stimulating to the nervous activities. It is possible to live on fat, meat, and water alone, as the meat contains a certain small amount of carbohydrate substance in the form of muscle sugar. Such a diet would be harmful for most people, however.

The amount of meat for daily consumption cannot be prescribed except in a general way, as it is dependent upon age, occupation, and climate. Young and growing individuals, those doing strenuous physical and mental work, and those living an outdoor life—especially in cold climates—need an abundant supply of flesh in the form of meat, fish, and eggs. For most persons living a quiet, sedentary existence such diet is not necessary and may be harmful. As meat is the most expensive article of diet, it is apt to be eaten in excess by the wealthier classes. In this event the products formed in the body are not sufficiently consumed and the waste accumulating in the system occasions such diseases as gout, lithemia, stone, possibly

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rheumatism, and various digestive and nervous disturbances. In some diseases, as Bright's disease of the kidneys, meat may be positively fatal. In eggs we also have a very concentrated food. The white of the egg is practically pure protein or albumin with some water and salts. When it is coagulated firmly, as in a hard-boiled egg, it is not nearly so digestible as when raw or soft-boiled. In the yolk of the egg there is much fat (thirty per cent) and some protein. For this reason if eggs are eaten constantly by those with weak digestions, indigestion of that form known as biliousness may be produced. Besides, the amount of fat in the yolk of egg may create a distaste for eggs altogether and, therefore, in giving eggs in milk (or eggnog) to the sick it is well to use only the raw white, which is also very valuable when dissolved in cold water.

Milk, as we have already pointed out, is a complete food, but is more particularly useful in supplying protein and fat in its most digestible form. Cow's milk contains approximately: proteids, four per cent; fat, four per cent; and carbohydrates (sugar), four per cent; while human milk from nursing mothers contains about the same amount of fat and a little more sugar and about half the quantity of proteids (proteids, one to two per cent; fat, three to four per cent; sugar, six to seven per cent). Consequently to render cow's milk fit for babies we must dilute it one-half to one-quarter (see *Infant Feeding*, Vol. III, p. 118).

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Milk is the most generally useful article of food for the sick and for babies, and for this reason should be the purest (see Food Adulteration, Vol. V).

Milk naturally becomes solid or curdled during the processes of digestion, so that it should be regarded as a solid food, and when the digestion is very feeble fluids should be used like broths, white of egg and water, or milk, to which is added substances to make the curd finer or to digest it. Milk to which is added salt, or one-third part of limewater, or rich milk diluted with an equal amount of soda water, constitutes a more digestible substance than pure milk. Milk is more readily digested if taken with other food (especially starchy food) at meals, but it is more appropriate at breakfast or lunch—the lighter meals—than at dinner or when much solid and proteid nutriment is eaten in addition to that contained in milk.

Vegetables also contain a proportion of proteid matter, but a much larger bulk is required to obtain the same amount, and they are not so digestible as meat. Peas and beans in the dried state contain about twenty-five per cent of proteids and nearly fifty per cent of starch, and are therefore extremely nutritious when they are well digested. This accounts for the popularity of baked beans, which, with the fat derived from pork, form a very complete food, although more appropriate for healthy outdoor workers. Soups made of peas and beans are, however, both digestible and exceedingly nutritious.

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All the cereals contain considerable proteid matter—ten to twenty per cent—of which wheat is the most valuable, but as the carbohydrates are the chief nutrients in this class of foods we will speak of them under that head. Rice is an exception, consisting mainly of starch. The carbohydrates, which are represented by starch, sugars, gums, and vegetable fiber, are to be found as the predominating ingredients in vegetables, although these also contain a considerable amount of proteids—as we have just seen—in many instances, and a not inconsiderable amount of fat in others. The products of the digested carbohydrates are oxidized or burned in the muscles, liver, and other parts with the production of heat and energy. These substances—if the body be likened to a machine—act as the fuel, while the proteids build the machine and keep it in order by making repairs or supplying the tissue as it wastes in the wear and tear of living. They may also form fat, and besides saving the consumption of proteids they may be transformed into proteids to some extent. There is not enough protein in vegetables to afford a complete food without the addition of an abundance of fat. Fat is also consumed in the body with the liberation of heat and energy, but an equal weight is approximately about two and one-half times as valuable as starch in this respect. Fat is then more valuable even than carbohydrates in supplying to the body that heat which is so necessary for nervous activity, especially in cold climates. The energy lib-

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erated by its consumption in the body, which is largely directed into muscular activity, is much greater than that obtained from starchy foods. Fat is a very essential part of the body and acts as a storehouse of energy which may be called upon in time of need when for any reason sufficient nourishment cannot be obtained. It lubricates the tissues and prevents constipation by the same action on the bowel contents. The body fat is probably chiefly formed from carbohydrates and proteids in the food, the fat in the food being burned up for the immediate necessities of heat and muscular movements. However, what is not needed as fuel may be directly transformed into body fat. Fat in abundance is particularly desirable in weakness of the nervous system, as nervous prostration; in all wasting diseases, and in those predisposed to consumption or tuberculosis. Fat is not so readily digested as many forms of proteid and carbohydrates. Those fats which are fluid at the temperature of the body are most digestible in a general way. Among the animal fats, butter, cream, and bacon are most digestible. Some vegetables, such as nuts, contain a considerable amount of fat, while Indian corn and oatmeal contain five per cent and over. Nuts are less indigestible when eaten in a paste as now sold. They are extremely nutritious. Peanuts for example, contain protein, twenty-eight per cent; fat, forty-one per cent. A vegetable diet, while containing all the necessary elements for a complete food, is too bulky for

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human beings to subsist on alone. When a mixed diet is not for any reason advisable, a sufficiently nourishing dietary may be obtained by the combination of vegetables with an abundance of fat in the form of butter and cream. Green vegetables and roots consist chiefly of water, seventy-five to ninety-five per cent. They are valuable for their palatability and because their succulence and indigestible residue assists the action of the bowels.

Certain properties are attributed to special vegetables. All green vegetables, especially spinach, are thought to be more valuable as a source of iron than any other food. Onions contain sulphur; celery and lettuce have some sedative effect upon the nervous system; new beets are digestible and contain considerable sugar; cabbage and all the green vegetables are rich in salts which are valuable in the body in assisting various processes. It is better to roast vegetables—as potatoes—steam them, or cook them in some way other than boiling (which removes the salts), unless the water in which they are boiled is used for soup or stews.

The cereals are the most concentrated of the vegetable foods. They contain about 10 to 15 per cent of water, from 10 to 20 per cent of proteids, from 60 to 70 per cent of carbohydrates, and from 0.5 to 6 per cent of fat, besides phosphates and other salts of value to the economy. Wheat—which may be regarded as most nutritious—contains 13 per cent of protein, 66

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per cent of carbohydrates, and 1.6 per cent of fat. The carbohydrates, represented mostly by starch, form, then, the chief bulk of the cereals. Starch is inclosed in nature in cells, which are ruptured by crushing, boiling, etc. The cereals are now largely consumed as breakfast foods, and are condemned as such by some of the best authorities on digestive disorders, on the ground that being soft they are bolted whole and thus escape mixture with the saliva, and so proper digestion. Most of the cereals now sold are cooked, in many cases roasted, and so prepared that the starch has become converted into dextrin and partially digested before eaten. While proper mastication should not on this account be avoided, yet the increased digestibility of the grain thus prepared is sufficient to offset criticism. On the contrary, one of the chief advantages of a vegetable diet consists in the fact that much of the starchy food in the coarser and harder grains which are not ground fine act as a stimulant to the bowels and thus prevent constipation. Flour made from whole wheat, besides containing more protein (in this case occurring as gluten), is less constipating than the very white flour, which does not contain the coatings of the grain and is deficient in gluten and phosphates. Fruits consist almost entirely of water, apples containing 84 per cent of water, 0.2 per cent of protein, and 15 per cent of carbohydrates. They are serviceable in aiding the action of the bowels through their contained acids, sugars, salts, and water, and are very slightly nour-

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ishing. Their nutritive value is so slight, however, that they should not be eaten between meals or sufficiently to spoil the appetite. Fruit is often harmful because unripe, and in the case of the quickly perishable varieties, as berries, from the presence of germs and fermentation. Disease germs in dust may also settle upon fruit when exposed for sale. When the outer peel is not removed, washing or cooking are desirable when any doubt exists as to the condition of the fruit. Berries and unripe fruit of any kind are comparatively indigestible. Young children should not receive fruit at all unless cooked, and to older children should be only permitted fruit of the right kind in moderation. Severe indigestion and convulsions may occur in infants two or three years old due to eating bananas.

In comparing the nutritive value of a vegetable diet with a meat diet we should understand that the difference is not so much in the chemical composition of the food as in the fact that a vegetable as rich in protein as meat, for example, is so much more bulky, weight for weight, that the human digestive organs can with difficulty take care of it. Peas and beans in the dried state contain about as much protein as meat (twenty-four per cent), and forty to fifty per cent of carbohydrates, and one to two per cent of fat into the bargain, yet in addition to their bulk when cooked, they are much more difficult of digestion than meat. In bread we have all the required nutrients, protein, car-

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bohydrates, fat, salts, and water in a digestible form and—with the fat added in butter—a complete food. Yet the amount of protein in bread is too small and the bulk of bread is too great to form a suitable sole diet. The digestible protein in vegetable food is, however, just as valuable as that in meat. To review the subject briefly it may be said that the chief functions of proteids consist in building up the body and in keeping it in repair. Meat proteids are more stimulating than vegetable proteids. Fats and carbohydrates furnish the heat so essential for any nervous and vital action, and for the work which is expressed largely in muscular action. Fat is more than twice as valuable as carbohydrates, and slightly changed chemically is taken more rapidly into the blood and is rapidly serviceable in the system. A mixed diet is the proper one for mankind; but when this is not feasible or advisable, a vegetable regimen, consisting largely of the comparatively concentrated grains with a liberal admixture of fat in the form of cream and butter, is compatible with an active and healthy existence.

The inorganic salts which are essential to the structure of bone and tissue are found in food enough to satisfy the demands except common salt, which is necessary to form the digestive juice in the stomach as well as being an important constituent of the fluids of the tissues generally. Salted foods, as salt pork, corned beef, salt fish, etc., are indigestible foods, for the reason that water is extracted by the salt from

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the food, and it therefore becomes drier, denser, and harder. Water should be taken to the amount of about three pints or six glasses daily in the form of drinks of some kind. It is better that half of this quantity be taken between the meals, so that the digestive juices be not unduly diluted, and so that the food be properly chewed and mixed with saliva and not simply washed down. Water is essential in dissolving the food elements, in aiding the escape of food from the stomach into the bowels, and in assisting the movement of the undigested and indigestible matter in the intestines and preventing constipation. Drinking an abundance of water also assists in the escape of waste matters from the blood and prevents the urine from becoming so concentrated that irritation of the urinary tract and the formation of gravel and stone might occur. An abundance of water also stimulates the appetite and facilitates the formation of fat. Iced water at meals is not desirable, neither is the promiscuous drinking of hot water; both interfere with the action of the digestive juices at such times. People leading sedentary lives are very apt to drink too little water, and this is also notoriously true of women.

Let us now consider the other agencies influencing digestion besides the food. Cooking has, of course, an immense influence on the digestibility of foods. In a general way broiling is better than frying, and baking is superior to boiling and stewing, for reasons already stated. Foods impregnated with fat are in-

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digestible, as pointed out, and this is why pastry is unwholesome although made out of the most wholesome materials. In baking, broiling, or frying meat or fish, a high temperature should first be applied to form a firm coating, which retains the flavor and juices. In making soups the opposite process should be pursued, the meat being cut up and allowed to stand in cold water or at very moderate heat for several hours to extract the juices. (For preparation of foods for the sick, see p. 261.)

The custom which is becoming more general of deferring the most substantial meal to the later hours of the day is based on the theory that at that time there is greater leisure and freedom from mental and physical activity, which tend to send blood to the brain and muscles, and so far deprive the digestive organs of their share. Also that at this time the frame of mind is apt to be more conducive to undisturbed digestion. The case of young children is different, and it is better for them to have the principal meals at breakfast and at midday, with a light meal before retiring. It is also very important to prevent children from eating between meals and from eating candy and sweets. Persons who do heavy manual labor usually have large appetites and good digestion, and so require and may take a large amount of food with each meal with impunity.

The matter of dress in women affects the digestion. The use of tight corsets, particularly when they

constrict the upper part of the abdomen, tends to displace downward the organs essential to good digestion—the stomach, liver, and intestines, together with other parts—and so cause great interference with their functions. Such a condition is called enteroptosis, and is said to occur in fifty per cent of all women. A large variety of symptoms, not directly attributed to the digestion, occur, and the condition is responsible for a great deal of invalidism. Prevention is better than cure, and a word to the wise should be sufficient. Enteroptosis can only be recognized by a physician, and the means of cure, or rather relief—as cure is generally impossible save by surgical operation—can only be applied by him.

TEA AND COFFEE.—Tea may interfere with the digestion when taken at meals, because its contained tannin restricts the secretion of digestive juice in the stomach; while coffee often induces indigestion and biliousness through the oil which it possesses. These beverages do no apparent harm, however, when taken in moderation by some healthy, well-nourished persons. Moreover, it is a curious fact that in all the national beverages of the world, caffeine—the active principle of coffee, tea, and cocoa—is to be found as the chief ingredient. Yet in anæmic, poorly nourished individuals leading a sedentary life, and among those who are poorly fed and possess weak, nervous systems the damage wrought is only too universal. Indigestion, constipation, palpitation, and irregular heart

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action, headaches, neuralgia, nervousness, and sleeplessness are among the more frequent symptoms. In many persons, on the other hand, a cup of coffee at breakfast will immediately stimulate a movement of the bowels.

While the use of tea and coffee cannot be totally condemned, if any symptoms arise which suggest that they are inadvisable in any individual case they should absolutely be avoided, since only in this way is it possible to discover whether any symptoms which are present can be referred with certainty to these beverages. Many wretched, nervous people are merely cases of coffee poisoning.

ALCOHOL.—While there are many differences of opinion in respect to the action of alcohol, yet there are certain well-known facts which it may be of advantage to state. That alcohol is of benefit to the healthy person living under normal conditions it is impossible for anyone to prove. But, on the other hand, it can be positively demonstrated that the habitual use of a moderate amount of alcohol, or the occasional use of an excessive amount of alcohol, are capable of greatly damaging the health.

It is, furthermore, an incontrovertible fact that alcohol is often of the greatest service in disease and, under certain conditions, in preventing disease. Again, while the occasional use of alcohol in moderation may not cause any visible injury in the average healthy individual, yet in some otherwise healthy individuals

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its influence is so great that it becomes impossible for them to use it in moderation. Moreover, some individuals can habitually use considerable amounts of alcohol without suffering an apparent detriment therefrom (although their children very probably will); while other persons, apparently as strong and living under the same conditions, will be completely wrecked by it within a short period. Alcohol has been called by some a food, by others a poison. It is either or both according to the point of view. It is not a food in health because the harm that it does completely overbalances its effect in supplying heat and energy. It is, besides, a very expensive food, and must be paid for in blood as well as coin. Alcohol is particularly harmful for frequent use by women and children, but is often of positive benefit for the aged. Like tea and coffee, alcohol is much more injurious to the underfed than to the well-nourished individual. It temporarily calls out force that should remain stored in the body, and if the food is insufficient to replace this extra amount the system is still further impoverished. Causing at first greatly increasing muscular power for a very short period, alcohol after this time causes a marked loss of strength—sometimes to the extent of fifty per cent. Exact methods of examination show that the mental power and memory are greatly lessened by any considerable quantity of alcohol, together with the functions of the special senses; that the acuteness of sight, smell, hearing, and touch is greatly dimin-

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ished. Alcohol is thus a bad preparation for any work which requires judgment, memory, and the utmost capacity of the special senses. And we have seen it is equally bad for sustained muscular work. It should only be used after severe exertion and after extra demands on the system—never as a preparation for them. Alcohol greatly lowers the body temperature, especially when one is exposed to cold. It is related of certain explorers who were spending the night on a cold mountain top, after a hard day's climb, that some took no stimulant and turned in cold and miserable; that others took whisky in moderation and retired feeling somewhat warmer and more comfortable; that the rest indulged freely in drink and retired oblivious of all cold and discomfort whatever. In the morning those who had refused alcohol arose refreshed and well; those who had taken a little whisky awoke very cold and wretched; while those who had freely indulged did not awake at all, because they were dead. Alcohol is only appropriate after exposure and when one has got into shelter in a warm place—not before or during exposure to cold. The bad effects of alcohol on the healthy person are often reversed in the sick. The action of alcohol in reducing temperature of the body may be serviceable in fevers. The usual result of alcoholic stimulation in increasing the rapidity of the heart, in health, is frequently reversed in conditions of rapid heart action in disease, when the pulse may be slowed by alcohol. There is a general

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tendency toward a disappearance of alcoholism. Savage nations quickly succumb to the ravages of alcohol, and in the course of evolution and the survival of the fittest, the weak die. Thus, families and individuals addicted to alcoholic excess tend to perish, and the disease becomes less prevalent.

The effect of alcoholic beverages depends chiefly upon the amount of alcohol contained in them. Whisky, brandy, and rum contain approximately about fifty per cent of absolute alcohol. Gin contains about sixty per cent. California hock, Reisling, sherry, muscatel, Madeira, claret, and the Rhine and Hungarian wines usually contain from twelve to fourteen per cent of alcohol; imported port, twenty to thirty per cent; imported sherry, sixteen to twenty-two per cent; champagne, ten to thirteen per cent; ale, stout, and beer or porter, two to five per cent; hard cider, five to nine per cent. The stronger liquors, when given but slightly diluted, have a more rapidly stimulating effect in emergencies than the weaker forms of alcohol. The bouquet or flavor of alcoholic beverages depends upon the development of compound ethers in the course of time. Whisky should not be used until two years old, as in this time the harmful fusel oil and wood alcohol existing in small amount will be changed into the desired bouquet-giving ethers.

CHAPTER III

Exercise in General

EXERCISE.—Reference is here had to that form which is usually thought of and spoken of as muscular exercise. There are involuntary muscles, so called because they are not under the control of the will—as the muscles of the heart, of the digestive tract, of the blood vessels, and of the diaphragm; and there are the voluntary muscles which we use in exercising. A muscle is made of numerous small, microscopic fibers bound together in bundles and attached usually to the bones—in the case of voluntary muscles—at either end by a white, strong tissue in the shape of a cord. Muscular action consists in a shortening and thickening without change in bulk. In this way one bone is moved upon another. But the muscle is only part of the mechanism necessary to muscular action or exercise. The mechanism concerned in exercise is a neuromuscular (nerve-muscle) one. In this mechanism there is the nerve center in the brain, the nerve which carries impulses from this to centers in the spinal cord, nerves which transmit impulses from the cord to the muscle, and the muscle itself.

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Muscular action may be voluntary, automatic, or reflex. In voluntary action an impulse originates in the brain and travels along the circuit just described at the rate of nearly two miles a minute till it reaches the muscle and results in contraction. Automatic action is sustained by impulses which are sent from the central nervous system to the muscles without conscious knowledge or volition, as occurs in reference to the heartbeats and movements of the digestive organs. Reflex action happens when an impulse, started by some irritation of a nerve of sensation, is conveyed along that nerve to the brain or spinal cord and is there transformed into an impulse which travels along the motor nerve of a muscle and results in contraction of the muscle to which the nerve is connected.¹ Reflex action occurs independently of the will, as when the eyeball is touched and movement of the eyelids or winking results, or the sole of the foot is tickled and the foot moves. Such action may even happen when the subject is unconscious or asleep, or even in spite of attempted opposition by the will. In addition to the nervous impulse there must be a sufficient supply of force and heat-making material brought to the muscle. This, as we have seen in the consideration of the rôle which food products play, consists chiefly in the digested and absorbed products of sugar and starchy food of vegetable origin which are burned in the muscles by the oxygen brought to them in the blood,

¹ See colored illustration, Volume III, Page 38.—EDITOR.

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and the result is the production of heat and muscular work or contraction. Exactly what a nervous impulse consists in, and just how the burning or oxidation of food products (as various forms of sugar in the muscles) result in muscular contraction, we do not know. As has been noted in the discussion on food, although muscular action resulting from the burning of sugars in the muscles which are derived from vegetable food is most economical, yet a diet of meat and fat will be burned with similar effect. Muscular fatigue is due to three causes: failure in the food supply of the muscle, accumulation of waste products of the chemical changes taking place in the muscle, and—most important—failure of the nervous system to transmit impulses to the muscle. This nervous insufficiency may be due to the paralyzing effects of the waste products formed by the chemical changes in the muscles upon the ends of the nerves connected with them; or to alterations in the brain cells which have been detected microscopically after overuse of the muscles in animals. In any event it is of the utmost importance that one should have a realizing sense that in muscular exercise the efficiency of the nervous system is the most essential factor. It is, indeed, quite generally recognized that nervous activity and force is of great value even in purely physical contests, and conversely that in nervous exhaustion or prostration the muscular power is sometimes almost abolished.

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Effect of Exercise on the Body as a Whole.—In muscular exercise there must also be nervous exercise. Just as the muscle grows larger, stronger, and firmer by exercise, so the brain and nerve cells become more efficient in the way of rapidity, acuteness, and precision in the execution of movements. Exercise of the muscles then develops the brain to a certain extent. During muscular work the combustion of fuel in the muscles gives rise to much heat and waste matter. The heartbeats are increased in number and force. This follows for several reasons: increased temperature of the body leads to acceleration of the heart, also waste matters circulating in the blood and greater blood supply to the heart. When a muscle contracts, the arteries conveying the blood from the heart widen and permit a freer circulation of blood through it. The veins, which carry the blood from the muscles to the heart, possess valves which prevent the blood from flowing back away from the heart. During muscular contraction the veins are compressed by the muscles, and this compression has the effect of forcing the blood onward toward the heart. Thus the amount of blood which flows through the muscle during exercise has been found to be three times greater than when the muscle is at rest. The muscles have, therefore, been likened to hearts. The heart, in its turn, is but a muscle. The greater quantity of blood which flows through the heart during exercise stimulates it to contract more forcibly, and the action being more rapid—

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for the reasons stated—and being more fully nourished by its increased blood supply, it follows that the heart grows larger and stronger, like any other muscle. The breathing is also stimulated and becomes more rapid and deeper. This is because the waste matters formed during muscular action stimulate the nerve center of the brain which regulates the breathing, and thus more oxygen is taken from the air in the lungs and carried from thence by the blood to the muscles, where it is needed to oxidize or burn the food products necessary to muscular activity. Notwithstanding the increased amount of heat formed in muscles during exertion, the temperature of the body is but slightly raised by the most violent exercise, because the augmented circulation in the skin brings more blood to the surface. This condition allows of greater loss of heat from the skin, and stimulates the sweat glands, so that there is a large escape of heat from evaporated moisture. An enhanced blood supply in the digestive organs favors improved digestive capacity and appetite.

Excessive Exercise.—The heart is apt to suffer in excessive exercise. If this is sudden, the heart becomes dilated and weakened. If continuous, the heart is prone to become an enlarged and overgrown muscle, so that it is too strong and powerful for existence in ordinary life, and not having enough resistance to overcome in sedentary occupations, may cause great distress by beating tumultuously and irregularly. The enlarged heart and thickened heart may weaken in

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time if the condition does not disappear. The valves of the heart are also sometimes so strained that they give way.

Regulation of Exercise.—The amount of exercise that is advisable is a doubtful matter. It is commonly stated in books on hygiene that an adult should perform daily an amount of exercise equivalent to walking nine miles on a smooth level road at the rate of three miles an hour. But this information does not help the average individual much whose daily vocation does not include pedestrianism. The form of exercise which is most suitable for children consists in play outdoors which does not tax the nervous system as do exercises involving precise movements necessary to the skilled use of tools or other instruments.

Besides the outdoor exercises which favor general development, as rowing, swimming, wrestling, and riding, it is well to promote special development of any parts which are naturally deficient, by means of gymnasium work adapted to the individual requirements. Such a curriculum is advisable during the early years of growth. When the nervous and muscular systems are well developed it is time that exercises requiring precision of movement be undertaken, as the handicrafts, the use of musical instruments, and any special lines of manual acquirements. The period suitable for these exercises may date from the sixteenth year onward through life. It is now generally conceded that exercise to be most beneficial should be agreeable to

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the partaker, thus contradicting the old theory—a favorite with parents—that the ax and chopping block in the cellar should prove a sufficient pastime to the restless and play-loving youth.

As has been stated under the section on food, eating immediately after severe exertion, and severe exertion immediately after eating, are both inadvisable, since the necessary supply of blood for digestion is apt to be diverted to the muscular system.

In this strenuous and muscular age it is malapropos to hint that arduous exercise may not be necessary to an active and healthy existence. There is, however, a vast number of persons who live active (as opposed to sedentary) lives, in perfect health, without taking exercise apart from that requisite to their vocations. The manual laborer is, of course, eliminated from this category. Habit is an important factor, and mental exercise appears to act as a substitute for muscular exertion. The banker and the clergyman are more long-lived than the farmer, and the most noted thinkers and literary workers have more often than the Samsons been numbered among the octogenarians. There is no doubt that exercise in youth in the open air is of the utmost value in promoting the general development of mind and body, and that the country is the place in which to rear children. There is also no doubt that sudden and violent exercise repeatedly performed—as in competitive trials—or that overuse of certain muscles is injurious.

Part II

**HOME EXERCISE WITHOUT
APPARATUS**

BY

DUDLEY A. SARGENT

Acknowledgment

WE beg to tender grateful acknowledgment to author and publisher for the use of these extracts and illustrations from Dr. Dudley A. Sargent's "Health, Strength and Power," copyright, 1904, by the H. M. Caldwell Company.

CHAPTER I

Description of the System

IN devising a system of exercises without apparatus for home use, I have endeavored to attain several essential requisites :

First, that the exercises selected shall tend to correct the special defects and deformities that accompany many occupations ;

Second, that many of the exercises shall contribute to the all-round development of the body ;

Thirdly, that most of the exercises selected shall tend to give *organic vigor* to the individual as well as strength to the muscles ;

Fourthly, that most of the exercises selected shall cultivate the power of producing objective as well as subjective effects.

Corrective Exercises.—Many of the common defects and deformities, such as drooping head, round shoulders, flat chests, etc., result from a weak and relaxed condition of the muscles whose office it is to move and support these parts. If the head is constantly bent forward, as when studying or working at a table, bench, or desk, the muscles on the back of the

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neck gradually lose their tone and stretch out as does a piece of elastic cord that is supporting a weight continuously. This stretching of the muscles that usually support the head in an upright position allows the head to droop or incline forward, and unless the muscles regain their tonicity through appropriate exercise, the defect of a "drooping head" is likely to become a permanent one.

This special defect may easily be overcome by systematically practicing any vigorous exercise that draws the head upward and backward repeatedly, followed by brief intervals of rest. One very good exercise for this purpose is to recline upon the floor, face downward, and raise the head upward as far as possible. There are many others.

It will be observed that in this case the attention is devoted to one part of the body, that of the head, and all of the energy is concentrated upon getting it upward and backward. This is the essence in all corrective work, and the result aimed for is essentially local.

Upon further observation, however, it will be found almost impossible to produce strictly local results without the coöperation of other parts. For instance, getting the head back to its normal position, after it has become drooped, implies the gradual stretching of the muscles of the front of the neck, chest, and abdomen, and the gentle toning up of the muscles of the spine, buttocks, and back of the thighs and legs.

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Similar coöperative or concordant changes in other parts of the body would accompany the correction of any other local defect or deformity. The body is so well poised upon a pillar of separate bones that anything that disturbs the balance or equilibrium of one part disturbs the equilibrium of all other parts, and a new adjustment of the different proportions of the body has to be made.

So firmly have I become convinced of this fact, and the tendency of the body under normal conditions to assume its normal shape, that I think the attempted correction of any local defect should be supplemented by an all-round development of the entire muscular system.

This all-round development may best be attained without apparatus by throwing the body into such attitudes as require great general effort of the muscles of the trunk and limbs to get into, get out of, or sustain. With the human body, as with any material body, the nearer it gets to a horizontal position, the more difficult it is to get it into a vertical position again. The parts of the body used and the number and variety of the muscles engaged depend, of course, upon the positions assumed, while the speed and energy with which the attempts to get into and out of these different positions are made measures the intensity of the exercise.

In most free exercises the limbs are used for weights or resistance. In a man weighing 150 pounds,

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the arms usually weigh about ten pounds each, and the legs twenty pounds. Where the arms and legs are used separately, much may be done to develop them by free work, as by dumb-bells and weights, by giving sole attention to the parts to be developed.

The principal objection to this method of development is that the results attained are not only largely local, but inevitably tend to remain so. The only way to develop muscle is to increase its nourishment by sending more blood to it. This is the chief object of bringing a muscle into action and concentrating the mind and energy upon it. But the heart is the principal organ involved in sending an increased supply of blood to a part after the lungs and stomach have contributed their life-giving properties. Though it is possible, therefore, for a man to attain a good general development by developing one part at a time, the strength acquired through this method is often local rather than general or constitutional. A person who has acquired his general development in this way is very much in the same condition as a factory which is supplied with a great many different machines of greater or less capacity. Under ordinary circumstances only a few of these machines are used at one time, and the engine and boiler have been constructed to meet the demands of these few machines. If the occasion ever arises for using a larger number of these machines at the same time, the power of each one will of course be greatly lessened, and consequently the

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working capacity of each machine will be greatly reduced. So with the locally developed man; if he ever wants to run, row, swim, or engage in any exercise calling for the use of a great many muscles at the same time, he will find the power of each group of these muscles very much reduced.

Although exercises requiring the use of but few muscles at a time may be advisable in case of a weak heart or weak lungs in a debilitated person, they are not the exercises that are most advisable to practice where the aim is to strengthen and invigorate these important organs.

This brings us at once to the consideration of the kind of exercises that are necessary to practice in order to cultivate organic vigor. By organic vigor I mean the vigor of heart, lungs, stomach, brain, and supporting tissues necessary to meet the vital demands of the whole system.

When we use a few muscles at a time, as in moving a single part of the body, as an arm or leg, it is possible to make so much exertion with these muscles as to exhaust them completely. On the other hand, if the whole body is engaged in the effort, the respiration and circulation will be so much increased that we shall be much "distressed for breath" and have to stop long before we can bring about the exhaustion of the muscles. The power to continue the general effort for a long time, or until complete exhaustion follows, may be termed organic vigor.

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This may be cultivated to some extent by practicing exercises which, though requiring the use of comparatively few groups of muscles, may be done so rapidly, energetically, and persistently as to bring the heart and lungs into great activity, as bicycling, dancing, etc. Even in these exercises great speed and prolonged activity generally involve the use of many more muscles than are used ordinarily, and increase of speed and long continuance of effort also tend to bring greater strain on the nervous system. Generally the more muscles and tissues involved in the exercise, the greater the action of the heart. The best exercises, therefore, for invigorating the heart and lungs and improving the entire organism are those that bring large groups of muscles into action, like rowing, running, swimming, etc.

If these exercises are done slowly, and according to a certain rhythm, for a considerable time, the results are most favorable. The heart, though at first quickened by these exercises, is eventually made to beat more slowly, regularly, and powerfully, and is less disturbed by any sudden and unexpected call upon it.

The practice of gymnastics and the concentrated form of free exercises tend largely to the development of muscular power; while the practice of athletics, especially running, rowing, swimming, etc., tends rather to the cultivation of respiratory and circulatory power. What is needed is a more harmonious blending of the practice of both gymnastics and athletics.

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Many of the exercises selected for this book have been chosen for the purpose of cultivating organic vigor and good staying power, as well as muscular strength.

The waves of popular enthusiasm for muscular development that have swept over the country during the past few years have induced some overzealous persons to advocate strongly certain "quick-and-ready methods" of attaining the desired result. The method which has been most extensively advertised, and which has received the most attention, is that which advises the concentration of the will upon the muscles to be developed, and the simultaneous resistance of the muscles opposed to their contraction. To use a familiar phrase, what is true about this method is not new, and what is new is not true.

Every schoolboy is familiar with the fact that by concentrating the mind upon the biceps, and slowly flexing the forearm toward the shoulder, the biceps muscle becomes larger and firmer than when it is in a passive state. Apply this principle to the other muscles of the arms, legs, and trunk, and you have the essence of the concentration theory in a nutshell. Now if you will place the fingers of your left hand on the biceps of your right arm, and the thumb on the triceps or back of the arm, and flex the forearm, while trying to keep the whole arm as stiff and rigid as possible, you will be conscious of two facts. First, the muscles on the back of the arm will be hard and tense, as well

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as those on the front of the arm, and, secondly, the whole arm will be more or less immobile.

If two forces act upon a body, one pulling one way and the other in the opposite direction, the body will move slowly and reluctantly toward the force which is the stronger. If the forces exactly balance each other, the body will not move at all.

There is no doubt that by concentrating the mind upon a group of muscles, during their action, the blood may be made to flow more freely to those muscles, and thus tend to improve their nutrition and development. So standing in front of a looking-glass, and becoming for the time being a devoted admirer of one's own physique, will through some psychic influence help to the realization of the desired object. By repeatedly contracting and relaxing the different muscles of the body, while under the influence of this psychic stimulus, a more direct communication between brain and muscles seems to be established, and as a preliminary introduction to other exercises this method is unobjectionable.

But when one devotes too much time and attention to these self-centred movements he is likely to become, if not vain and egotistical, extremely conscious of his many muscles, and this very consciousness, when he attempts to effect something outside of himself, may lead to his embarrassment. It is very difficult to concentrate the attention upon more than one group of muscles at a time, yet the practice of fencing, boxing,

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tennis, and many skilled sports requiring mental alertness, brings many groups of muscles into action almost simultaneously. In practicing such exercises and most athletic sports, the mind must be given directly to the goal to be won, or the thing to be achieved. Any attention given to the muscles engaged in the separate movements would be a hindrance instead of an assistance. Concentrate the attention upon the muscles of the right arm and shoulder and try to throw a ball at a target, and see what the result is.

If the preliminary practice has called for the contraction of antagonistic muscles as a means of resistance, the arm and shoulder will feel very much as though they were bound with straps or cords, that make freedom of movement very difficult. This is what is sometimes termed being "muscle bound," and unfits one for the practice of any skilled sport. The contraction of antagonistic muscles makes one stiff, stanch, and strong, but it is not the kind of strength that is serviceable. In competitive games one so trained spends much of his energy in competing with himself, as it were. In training men for the practice of skilled sports, one of the first essentials is to teach them to *relax*, and not to contract, antagonistic muscles.

CHAPTER II

Exercises for Everyone

CHILDREN are very fond of imitating the efforts of older persons, and at a very early age they aspire to be men, and introduce into their childish plays and games many of the forms of activity that chiefly concern men. Children are also very fond of imitating different animals and various kinds of machines. By taking advantage of this keen faculty for imitating the employments of their elders, the interested parent or teacher may often induce children to follow her through a very valuable series of exercises for strengthening, developing, and corrective purposes.¹

These exercises are especially designed to bring into action the large surface muscles of the trunk and limbs rather than the smaller and finer muscles of the hands, arms, and feet, which, for the benefit of the child's nervous system, may better be developed later.

If the parent or teacher will lead up to these valuable exercises through some sort of dialogue or story that will appeal to the imagination and suggest plenty

¹ Dr. Sargent refers here to such of the movements devised by him as are of an imitative, picturesque nature. See "Chicken Wings," "Striking the Anvil," "Rowing," in the list below.—EDITOR.

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of action, such as going on a journey or a picnic, where different experiences occur as a matter of course, he will find the interest of the child greatly intensified. Not only will the child enter into the exercises with the keenest enjoyment, but the exercises themselves will prove much more beneficial.

In giving exercises to children, remember that the one thing they cannot stand is continuous tension and monotony. This is what makes walking, standing, and all attitudinizing and slow-moving exercises so wearisome to children. Give them short, quick, lively exercises, with frequent changes and plenty of rest.

It matters not how interesting or amusing the exercise, game, or play is, the child soon wants to "play something else." The following list, which may be best given in the order enumerated, are very good exercises for children, both from the standpoint of interest and development.

Selections from Dr. Sargent's Exercises for CHILDREN

Adoration	(see page 81 for pictures)
Chicken Wings	" " 91 " "
Signal Station	" " 93 " "
Striking the Anvil	" " 85 " "
Rowing	" " 95 " "
Restoration	" " 96 " "

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The age of youth is the time to foster and cultivate the heroic virtues, and there is no better way of doing it than by the *judicious* practice of manly sports and games.

When we come to a practical application of these theories, however, we find it very difficult to realize the many advantages claimed for athletic sports. The large amount of land required for the practice of the popular games, and the small amount that is available in large towns and cities, where out-of-door activity is most needed, places at once a limit on the number of our youth who can engage in these invigorating exercises. Then again, the high standard of skill and ability demanded of those who participate in the sports and games necessarily restricts the number who can take part in them: Firstly, by discouraging a great many boys from trying to qualify for the athletic teams, which they find they cannot do without giving more time to practice than they can afford, and, secondly, by eliminating a great many by process of trial who are physically unfit to stand the strain of the contests.

Thus our present-day athletics bring to the front a small minority who are naturally strong and vigorous and do not need so much physical training, and shut out the great majority of the boys who are not so well endowed physically and who do need just this kind of training to prepare them for their life's work.

For those who are left out in the competition for places on the school and college athletic teams, and for

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those who are really in earnest in their desire for physical improvement, I offer a series of developing exercises without apparatus, which may be termed Home Athletics.

These exercises may be practiced at any time and in any place. They are not only designed to give one a fine all-round development, but to attain that form in practice which it is necessary for one to have who wishes to excel in the several athletic events.

Selections from Dr. Sargent's Exercises for

BOYHOOD AND YOUTH

Adoration	(see page 81 for pictures)
The Boxer's Guard	" " 89 " "
Swimming (Breast Stroke)	" " 87 " "
Rowing	" " 95 " "
Restoration	" " 96 " "
Signal Station	" " 93 " "

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Success in life depends largely upon energy, strength, courage, alertness, persistency, stamina, and endurance, and it is the province of athletics to cultivate and maintain these manly virtues.

If a young man comes to the threshold of his business or professional career without these qualities, he should lose no time in trying to acquire them; or if he has them, in trying to keep them in active service.

If the opportunity offers, join a gymnasium, or some of the numerous clubs I have mentioned, for the practice of physical sports and recreation. Avail yourself of every chance to walk to or from your business, if not more than a mile or two in distance. Occasionally break into a run, stopping just short of the perspiring stage. Don't take an elevator if you only have one or two flights of stairs to climb. Skate, swim, hunt, fish, row, and dance as the opportunities present themselves. Don't despair of attaining physical vigor, even if all of these different avenues of sport are closed to you. Remember you always have home athletics and physical exercises that you may take in your room to fall back upon. I have seen some excellent results obtained by the practice of these simple exercises. They require a little courage at first, but if you keep at them persistently until the habit is established, good will surely follow, as a matter of course, and you will begin to feel stronger and better from the start.

One advantage these exercises possess over many others is that they may be taken in the morning or

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evening, as you are dressing or undressing, so that no change of clothing is necessary. As a general rule, unless the temperature of the room is below 50°, the less clothing one has on during exercise, the better.

Try to get into a perspiring state, or at least a warm glow, before finishing your exercises, take a cold sponge bath immediately afterwards, and rub down with a rough Turkish towel. The following is a list of excellent exercises for young men, which will be followed by the best results if taken in the order given.

Selections from Dr. Sargent's Exercises for

YOUNG MEN

Adoration	(see page 81 for pictures)
The Boxer's Guard	" " 89 " "
Rowing	" " 95 " "
Restoration	" " 96 " "
The Signal Station	" " 93 " "

Exercise without Apparatus

Although girls are born a little smaller than boys, they soon overtake them in height and weight, and at the age of twelve are actually larger upon the average than boys of that age. If the girl has had a fair chance, she can often surpass the boys of her age in physical efficiency, as shown by her ability in running, swimming, bicycling, and general gymnastics. This physical superiority over the boy, however, only lasts for a few years; then he forges ahead of her, and by the age of twenty, the man, upon the average, is five inches taller, weighs twenty pounds more, and is fully two times as strong as the average woman of the same age. The superior height, weight, and strength of the girl of twelve are an indication of the importance which nature places upon these qualities as a preparation for the duties and responsibilities of the woman's life. At this time the woman must have perfected within her organism the vital machinery for supporting two lives instead of one, and this fact must ever afterwards be borne in mind. As strong, therefore, as I am in advocating a similarity of exercises and opportunities for physical training for both boys and girls up to the age of puberty, I am equally strong in the opinion that the girl's physical training should be very different from the boy's after this period. Not but that girls should be permitted and encouraged to still engage in many of the exercises usually monopolized by boys; but they must all be entered into with certain mental and physical reservations. A failure to

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regard this important consideration often brings ill health to girls and bad repute to gymnastics and athletics. We have, then, on the part of girls, an anatomical structure which requires just as much care and attention to keep it in good working order, an emotional nature which renders her more likely to carry the exercises she enjoys to excess, and a functional demand upon her organism that renders it necessary to keep a large stock of her power in reserve.

To insist upon girls playing violent athletic games under the same rules and regulations that govern the contests of boys, and to put them through the same vigorous method of training, is not only cruel to the girl, but it is suicidal to the race.

Selections from Dr. Sargent's Exercises for

GIRLS

Adoration	(see page 81 for pictures)
Tree Swaying	" " 83 " "
Swimming (Breast Stroke)	" " 87 " "
Striking the Anvil	" " 85 " "
Chicken Wings	" " 91 " "
Rowing	" " 95 " "
Signal Station	" " 93 " "
Restoration	" " 96 " "

Exercise without Apparatus

In the early history of mankind, women and men led lives more nearly alike, and consequently they were more alike, both mentally and physically, than they are to-day.

As an illustration, compare the Indian women and men with those of our white people. The former look alike, and the latter look unlike. This divergence of the sexes is a marked characteristic of progression among highly civilized races.

Woman's instincts teach her that her power and influence in the world depend upon making herself different from man. For this reason, and in order to accentuate her sex, she has encumbered herself with skirts and constricted herself with corsets for some three thousand years. Although these artificial restraints have hampered woman physically and organically, they have at least helped to preserve her identity. Long hair, smooth skin, broad hips, slender waist, sloping shoulders, large thighs, well-developed mammæ, and small wrists, ankles, hands, and feet will continue to be regarded as feminine characteristics, and the vast majority of women will adhere to these ideals long after the brawny athletic girls and the manly women have had their day.

While rejoicing, therefore, in the emancipation of woman from anything that interferes with the full development of her body, limbs, and vital organism, let us be sure that we do not recommend for her adoption as an aid to this development exercises that, when

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pushed to extremes, tend to unsex her. I refer to the highly competitive games and athletic contests now being introduced into many of the schools and colleges for women.

In order to keep these exciting games and contests within the bounds of safety, a careful system of training should be taken in preparation, and the rules so modified that the time of playing, distance run, height jumped, and weights thrown, etc., shall only be about one-half that expected of men.

To many who read this book it may seem absurd that I have thought it necessary to caution any class of women against carrying athletics to excess, realizing that many more women need to be stimulated in their efforts to take exercise, rather than to be repressed. This is very true, yet from my official position I have been appealed to so frequently for my opinion as to the advisability of women participating in athletics that I have taken this occasion to give expression to my views on the subject.

Probably the great majority of women have little opportunity or inclination to practice many of the sports and games I have enumerated. I know, however, that very many of these women are sadly in need of the life- and health-giving influence of some kind of physical exercise. To these women, and to all others who enjoy the pleasures of right living and well being, I recommend the following list of free movements and rhythmic exercises:

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Selections from Dr. Sargent's Exercises for

WOMEN

Adoration	(see page 81 for pictures)
Striking the Anvil	" " 85 " "
Tree Swaying	" " 83 " "
Signal Station	" " 93 " "
Rowing	" " 95 " "
Chicken Wings	" " 91 " "

It behooves every man to develop his muscles during his youth, and to learn and practice some game or exercise which he may practice and enjoy as he grows older.

Where this has not been done, and the man, as he voyages through middle life, finds himself in need of physical vigor to sustain him in his daily work, let him remember that he must begin *slowly* and *cautiously* to acquire this desired result.

Don't begin by holding the limbs rigid and making the muscles hard and tense, for this process shuts the blood out of the muscles, and uses up too much nerve force. You will get much better results by entering upon the practice of a series of slow, rhythmic movements, which call for the action of the large muscles about the chest, back, and abdomen, and which are such a powerful aid to the internal organs in performing their functions

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The list of exercises given in this book which are best adapted to those in middle life are as follows:

Selections from Dr. Sargent's Exercises for

MIDDLE-AGED MEN

Adoration	(see page 81 for pictures)
Signal Station	" " 93 " "
The Boxer's Guard	" " 89 " "
Chicken Wings	" " 91 " "
Restoration	" " 96 " "

In order to meet gradual changes in the system as one advances toward old age, the whole organism should be gradually slowed down. Less and less demands should be made upon all of the bodily functions, but more and more attention should be paid to fresh air, sunlight, proper food, clothing, bathing, and immediate environment.

Gentle, all-round activity of body and mind, followed by frequent intervals of rest, should be the rule. Nothing in excess. In order to meet the specific changes that are taking place in the bones, muscles, tendons, arteries, heart, lungs, nervous system, etc., special precautions should be observed in taking any kind of exercise.

Exercises and games that require sudden, quick, and forceful efforts, like boxing, tennis, hand-ball, etc., should be avoided. Exercises that require extensive

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body bending, reaching, and stretching, although admirable as a means of warding off some of the infirmities of old age, should also be avoided after the evidences of old age have become established.

Fencing, dancing, and exercises of skill which keep the nervous system under great tension should be abandoned; also rapid walking, running, bicycling, rowing, swimming, horseback riding, basket-ball, and all exercises and sports that bring great strain upon the lungs, heart, and blood vessels. Cricket, golf, bowling, bicycling, and other exercises that may be followed in moderation, may be continued up to seventy or eighty years of age.

The safest exercises, however, are walking, carriage riding, billiards, etc., that give gentle activity to body and mind, and may be indulged in great moderation.

As in infancy and early childhood all exercises began with simple movements of the arms, trunk, and legs, so as age advances, and one enters second childhood, these simple movements should again be relied upon to keep up life's current, and promote the necessary tissue changes upon which health in old age so much depends.

We have seen that movements taken without apparatus are very vigorous and tax the heart and lungs to a considerable extent, because so many muscles are brought into action. The best selection of movements for elderly persons is given at the close of this chapter.

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These should be practiced daily with great care and moderation, taking the slowest rhythms, and pausing frequently for rest. At the same time, one should enter with the heartiest interest into the affairs of life, making the home exercise supply what the day's work does not afford. Hold on to life tenaciously, and life will hold on to you.

Selections from Dr. Sargent's Exercises for

ELDERLY MEN

Swimming (Breast Stroke)	. (see page 87 for pictures)			
Chicken Wings	"	"	91	" "
Tree Swaying	"	"	83	" "
Striking the Anvil	"	"	85	" "
Adoration	"	"	81	" "
Signal Station	"	"	93	" "
Restoration	"	"	96	" "

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Exercise 1

ADORATION

Position.—Stand with feet and hands together, as shown in Fig. 1.

Movement.—Throw the hands and forearms backward until they assume the position shown in Fig. 2, with the elbows shoulder high and the palms forward. Return to the first position, and repeat the movement.

Times.—20—40—80. Rate per minute, 20—40—60.

Caution.—In doing this exercise, see that stress is placed upon throwing the hands backward, instead of the elbows. Do not throw the arms violently backward, as it causes an undue prominence of the collarbones where they join the breastbone.

Parts Affected.—Principally the muscles between the shoulder blades that tend to hold the shoulders back.



Fig. 1.



Fig. 2.

Adoration.

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Exercise without Apparatus

Exercise 2

TREE SWAYING

Position.—Stand with feet together and the arms extended above the head.

Movement.—Lean over to the left, as shown in Fig.

3. Sway back again to the right, as shown in

Fig. 4. Repeat the exercise.

Times.—10—30—60. Rate per minute, 30—40—50. Counting each movement.

Caution.—In this exercise do not keep the hands and arms rigidly straight above the head, as this might strain the muscles on the lower sides of the abdomen. It is better to relax the hands and arms somewhat, as shown in the illustrations.

Parts Affected.—Alternately the muscles on the right and left sides of the abdomen and lower back. An excellent exercise to help reduce the width of the waist in case of corpulency.



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Exercise without Apparatus

Exercise 3

STRIKING THE ANVIL

Position.—Stand with the feet twenty-four inches apart, arms extended in a horizontal position sideways, and head turned to the left, as shown in Fig. 15.

Movement.—While keeping both arms rigidly straight, swing the right hand over the head and bring it down on to the left hand with a slap, as shown in Fig. 16, then continue the circular movement downward with the right arm and hand until they are brought around to the first position. (See Fig. 15.) Repeat the exercise, and then hold the right arm and hand extended, and swing around on to them with the left.

Times.—10—20—30. Rate per minute, 12—24—36.

Caution.—This exercise may be improved considerably in its all-round effects by throwing the weight on to the advanced leg in striking the blow, and then swaying back on to the rear leg as the striking arm returns to the first position.

Parts Affected.—Shoulders, chest, broad muscles of the back, and oblique muscles of the abdomen. When the swaying movement is taken, the legs also come in for a share of the benefit.



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Exercise without Apparatus

Exercise 4

SWIMMING (BREAST STROKE)

Position.—Stand with the feet about twenty-four inches apart, the left foot advanced, the weight thrown back on to the right leg, and the arms bent at right angles ready for the beginning of the stroke, as shown in Fig. 11.

Movement.—Shoot the arms directly forward, incline the body forward, straighten the right leg, and throw the weight on to left leg, which should be bent at the knee, as shown in Fig. 12. Now sweep the hands and arms around outward and backward in a horizontal plane until arms, trunk, and legs are brought back to the starting position as described above. Repeat, reversing frequently the position of the front and rear legs.

Times.—10—30—60. Rate per minute, 25—30—35—40.

Caution.—In taking this exercise the arms, body, and legs should work simultaneously. Special stress should be put upon the alternate extension and flexion of the front and rear legs, and the inclination of the body forward and backward with each stroke.

Parts Affected.—Muscles of the arms, shoulders, chest, and upper back, but especially the extensor muscles of the thighs and back, and the muscles of the abdomen.



Fig. 11

Fig. 12



Swimming.

Exercise without Apparatus

Exercise 5

BOXER'S GUARD

Position.—Stand with the feet about twenty-four inches apart, right foot advanced, weight thrown back on to left leg, with left arm bent at right angles across the front of the neck, and the right arm extended backward, as shown in the illustration, Fig. 37.

Movement.—While maintaining the same position with the feet, straighten the left leg, throw the weight forward on to the right leg, at the same time bringing the right forearm up opposite the neck, and extending the left arm backward. (See Fig. 38.) Repeat the movement, springing alternately from the right and left foot. Place the left foot in advance and try the same exercise.

Times.—20—40—80. Rate per minute, 12—24—36.

Caution.—In springing forward and back from the balls of the feet, do not allow the heels to be raised from the floor, and be careful to preserve the rhythm of movement between the arms and legs.

Parts Affected.—Principally extensors and flexors of the legs and arms, also in a milder degree the muscles of the shoulders, back, abdomen, and chest.

Fig 38



Fig. 37.

Boxers Guard.



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Exercise without Apparatus

Exercise 6

CHICKEN WINGS

Position.—Stand with feet together and thumbs in the armpits, and elbows at the sides, as shown in Fig. 45.

Movement.—Raise both elbows as high as possible, and at the same time raise the left knee waist-high, as shown in Fig. 46. Lower the elbows and knee to the first position, then raise the elbows and right knee. Continue the exercise, raising the elbows and left and right knees alternately.

Times.—20—40—80. Rate per minute, 20—40—60.

Caution.—In doing this exercise, try and maintain perfect poise on the leg left standing, and take a full breath each time the elbow are raised, and expel the air from the lungs as the elbows are lowered.

Parts Affected.—Middle part of the shoulders, sides of the neck, and upper chest and back. The extensors of the legs and sides of the waist in maintaining the poise, and the flexors of the thighs in raising the knees.



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Exercise without Apparatus

Exercise 7

SIGNAL STATION

Position.—Stand erect, with heels together, and the hands resting upon the hips, as shown in Fig. 53A.

Movement.—Straighten the right arm outward and upward to the extended position over the head, at the same time elevate the left leg sideward to the extended position shown in Fig. 53B. Lower the leg and arm and repeat. Elevate the left arm and right leg. (See Fig. 54.)

Times.—15—30—60. Rate per minute, 20—40—60.

Caution.—Raise and lower the arm and leg simultaneously, and keep both as straight as possible. In lowering the arm, have the hand come down to the thigh, and not to the hip.

Parts Affected.—Muscles of natural and forced respiration put on the stretch, and side diameters of the lower chest increased; the muscles of the middle shoulder and abductors of the thighs are brought most prominently into action.



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Exercise without Apparatus

Exercise 8

ROWING

Position.—Stand facing to the right with feet about twenty-four inches apart, right leg advanced, and the arms held at the sides while bent at a right angle, as shown in Fig. 107.

Movement.—Lunge forward, throwing the weight of the body on to the right leg, bending the body, and extending the arms until the fingers touch the floor about twelve inches in front of the right foot, as shown in Fig. 108. Now return vigorously to the starting position, as though lifting a weight or pulling an oar. Repeat. Try the same exercise, facing to the left with the left foot advanced.

Times.—10—20—50. Rate per minute, 16—24—36.

Caution.—Be sure and keep both feet on the floor, bending the front leg as the body swings forward, and the rear leg as the arms are brought back. Energize the upward movement, and make it as steady and rhythmical as possible.

Parts Affected.—The muscles that erect the spine. The broad muscles of the back that pull up the arms, and the muscles of the hips, and back and front of thighs and legs.



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Fig. III A

Fig. III B



Fig. III B

Restoration

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Exercise 9

RESTORATION

Position.—Stand with the feet together, face downward, arms extended downward, and backs of the hands touching, as shown in Fig. 111A.

Movement.—Raise the hands, arms, and elbows, keeping the backs of the hands together until they pass the chest and face. (See Fig. 111B.) Then continue the movement upward, until the hands separate above the head with face turned upward (see Fig. 112), when they should be brought downward and outward in a large circle to the starting point, shown in the first position. Repeat the movement.

Times.—10—20—30. Rate per minute, 8—16—24.

Caution.—In this movement, begin to inhale as the arms are raised, and take in as much air as possible by the time the hands are above the head, then allow the breath to go out slowly as the arms descend.

Parts Affected.—This exercise brings into gentle and sustained action the muscles of natural and forced respiration.

CHAPTER III

Getting the Most Out of Exercise

IN order to realize the best results from physical exercise, enter with earnestness and enthusiasm into whatever you undertake. Half-hearted efforts are usually followed by half-hearted results. While choosing a place for exercise, bear in mind that the chief requisites are plenty of sunlight and fresh air.

If you have been inactive for a long time, begin to exercise gently, doing but a few movements the first day, and gradually increasing the time and amount of effort as you grow stronger and more enduring. Never continue your exercise to exhaustion, and always end as gradually as you begin. Do not keep the muscles on the stretch or under prolonged contraction, as frequently required in maintaining strained positions. Relaxation should always follow contraction, or, in other words, rest should follow exercise. The best way to secure local rest is to use the muscles of some other part of the body.

Exercise daily and at regular times, if possible; by so doing you will acquire the habit of exercise and your system will unconsciously nerve itself up to the

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effort expected of it. Do not exercise within two hours after eating or one-half hour before.

After pursuing the same kind of exercises for six or eight weeks, the system acquires a tolerance for them, as it were; that is, it ceases to respond to their developing influences. At this time better results may be attained by trying a change of movements or exercises.

The best physical and mental results may be attained from exercise, when circumstances permit of it, between ten and twelve o'clock in the forenoon, and the next best results between four and six in the afternoon. Where these hours are not convenient, very good results may be attained by exercising in the morning before breakfast, or the last thing at night, just before going to bed. If a person, however, for any reason does not sleep well, and awakes feeling tired in the morning, exercise before breakfast is not advisable, except perhaps a few minutes' walk in the open air. It is much better for such a person to exercise at night, not violently, but gently and persistently for fifteen or twenty minutes, in view of getting the excess of blood out of the head, and inducing a good night's sleep. For most persons I think that the hour before breakfast is a preferable one for home exercises. At this time they may be taken without the restrictions of clothing, in the fresh morning air, followed by the tonic effect of a cold sponge bath.

If there is any weakness of the heart, avoid the

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cold bath, and exercise slowly and deliberately, taking frequent intervals of rest. If the heart is strong, exercise vigorously and persistently enough to quicken the breathing and start the perspiration before you finish.

If you are undergoing a great mental strain, as during periods of school examinations, or in attending to an unusual amount of mental work, do not increase the amount of physical exercise at this time, but rather diminish it until after the mental strain is over. If, on the other hand, one is subjected to unusual mental or emotional excitement, it is better to increase the time and amount of exercise, using chiefly the muscles of the legs and lower trunk.

The mind exerts a powerful influence upon the tone and contractile energy of the muscles. Where it is desired to produce the best results upon the physique from a muscular or developmental point of view, give your whole attention to the exercise in which you are engaged. Execute every movement with accuracy and precision. Be conscious of the muscles you are using, and become, for the time being, a devoted admirer of your own physique.¹ If exercising before a looking-glass will help you concentrate your attention upon the contraction of muscles, use a looking-glass. Learn to cultivate a consciousness of the muscles that help you

¹ This theory, which is claimed to be original with some instructors who have recently put it in practice, was published in my "Handbook of Developing Exercises" in 1881.

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maintain the upright position, so that you will readily recognize them when you want them to do duty.

In order to offset the restricting and hampering effect of devoting too much attention to the muscles, after you are able to contract and relax them as you will, it is best for you to practice those exercises that require you to concentrate all your energy and attention upon the *thing to be done*, rather than upon the muscles that are engaged in doing it. Cultivate the power of relaxing instead of contracting antagonistic muscles. This is the athletic in distinction from the developmental point of view, but it leads to the more efficient working of the muscles.

All exercises must be performed with sufficient vigor and rapidity to engage the energetic contraction of the muscles employed. When this is done, old tissue is broken down, and its place is supplied with new material in increased quantity, thus augmenting the size and strength of the muscles. The brain gains the power and energy which the exercise requires it to put forth.

Try to secure a harmonious development of the whole body. One-sided development is usually attained by robbing some other part of its just share of the nutriment.

Most persons, in their daily occupations, use the flexor¹ muscles more than the extensors, thereby

¹ Flexors are muscles which bend the body and limbs; extensors, those which cause reaching or stretching.—EDITOR.

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cramping the vital organs and interfering with their functions. For this reason most of the free exercises introduced in this book are designed to act upon the back, chest, and side and front walls of the abdominal cavity.

A sufficient number of muscles should be called into action at one time to stimulate the action of the heart and lungs, and increase the circulation and respiration. This is one of the most important considerations to bear in mind in regard to exercise, for in such general activity all parts of the body are improved by your physical efforts.

Part III

**DIET AND CONDUCT FOR LONG
LIFE**

BY

SIR HENRY THOMPSON, BART.

Acknowledgment

THE publishers beg to tender grateful acknowledgment to Frederick Warne & Company, for use of these extracts from Sir Henry Thompson's valuable work, "Diet in Relation to Age and Activity," New York, 1905. All rights reserved.

Extract from
The Author's Preface

THIS little work, first published in 1886, had a very large sale both in this country and America for about nine or ten years, and is still inquired for occasionally, in the latter country especially, but has been for some time out of print. The recommendations and advice respecting diet and habits which it contained were the result of very large experience which an extensive practice, during at least twenty-five or thirty years at the date of its publication, compelled me to regard as much needed by men of all ranks and occupations among the well-to-do classes of society, who had reached, or perhaps had passed, the prime of life; whether engaged in business or professional pursuits or in varied public services, etc.

I was myself, at that time, sixty-five years of age, and may perhaps be permitted to add, belonged to one of the categories indicated, being certainly not one of its least active or occupied members.

It has recently occurred to me that, having now entered my eighty-second year, I may be able to offer many useful hints suggested by an increased experi-

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ence respecting the subject defined by the title, and also concerning other more or less allied matters relating to the habits of those who are advancing in years, and who desire still to maintain fair health and activity, without which prolonged life is scarcely to be regarded as a boon.

In the present edition . . . I have added about an equal amount of matter¹ in the hope that the additional portions may prove useful and acceptable. Naturally, certain subjects require to be treated in each of the two parts, but relating in the former to the sixth and seventh decade of human life, and in Part II to the eighth and ninth decade.

¹ Chapters III, IV, V.—EDITOR.

CHAPTER I

I HAVE come to the conclusion that a proportion amounting at least to more than one-half of the chronic complaints which imbitter the middle and latter part of life among the middle and upper classes of the population is due to avoidable errors in diet. Further, while such disease renders so much of life, for many, disappointing, unhappy, and profitless—a term of painful endurance—for not a few it shortens life considerably. It would not be a difficult task—and its results, if displayed here, would be striking—to adduce in support of these views a numerical statement showing causes which prematurely terminate life among the classes referred to in this country,¹ based upon the Registrar-General's reports, or by consulting the records of life-assurance experience. I shall not avail myself of these materials here, although they would form an interesting theme of study for the purpose. My object is to call the attention of the public to certain facts about diet which are insufficiently known, and therefore inadequately appreciated. And I shall assume that ample warrant for the observations made

¹ England.

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here is within my reach, and can be made available if required.

At the outset of the few and brief remarks which the space at my disposal permits me to make, I shall intimate, speaking in general terms, that I have no sympathy with any dietary system which excludes the present generally recognized sources and varieties of food. It is possible, indeed, that we may yet add considerably to those we already possess, and with advantage; but there appears to be no reason for dispensing with any one of them. When we consider how varied are the races of man, and how dissimilar are the climatic conditions which affect him, and how in each climate the occupations, the surrounding circumstances, and even the individual peculiarities of the inhabitants largely differ, we shall be constrained to admit that any one of all the sources of food hitherto known may be made available, and may in its turn become desirable, and even essential to life.

Variation of Climate

To an inhabitant of the arctic circle, for example, a vegetarian diet would be impracticable, because the elements of it cannot be produced in that region; and were it possible to supply him with them, life could not be supported thereby. Animal food in large quantity is necessary to sustain existence in the low temperature to which he is exposed. But I desire to

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oppose any scheme for circumscribing the food resources of the world, and any form of a statute of limitations to our diet, not merely because it can be proved inapplicable, as in the instance above named, under certain local and circumscribed conditions, but because I hold that the principle of limiting mankind to the use of any one class of foods among many is in itself an erroneous one. Thus, for example, while sympathizing to a large extent myself with the practice of what is called "vegetarianism" in diet, and knowing how valuable the exclusive or almost exclusive use of the products of the vegetable kingdom may be for a considerable number of the adult population of our own and of other countries in the temperate zones, and for most of that which inhabits the torrid zone, I object strongly to a dogmatic assertion that such limitation of their food is desirable for any class or body of persons whatever. Moreover, an exclusive or sectarian spirit always creeps in sooner or later wherever an "ism" of any kind leads the way, which sooner or later brings in its train assertions barely supported by fact, the equivocal use of terms, evasion—in short, untruthfulness, unintended and unperceived by the well-meaning people who, having adopted the "ism," at last suffer quite unconsciously from obscurity of vision, and are in danger of becoming blind partisans.

But why should we limit by dogma or otherwise man's liberty to select his food and drink? I ap-

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preciate the reason for abstaining from alcoholic drinks derived from benevolent motive or religious principle, and entertain for it the highest respect, although I cannot myself claim the merit of self-denial or the credit of setting an example—abstaining, like many others, solely because experience has taught that to act otherwise is manifestly to do myself an injury.

This brings me to the point which I desire to establish, namely, that the great practical rule of life in regard to human diet will not be found in enforcing limitation of the sources of food which Nature has abundantly provided. On the contrary, that rule is fulfilled in the perfect development of the art of adapting food of any and every kind to the needs of the body according to the very varied circumstances of the individual, at different ages, with different forms of activity, with different inherent personal peculiarities, and with different environments. This may read at first sight, perhaps, like a truism; but how important is the doctrine, and how completely it is ignored in the experience of life by most people, it will be my object here to show.

Bodily Income and Expenditure

Let it be understood that in the matters of feeding and bodily activity a surplus of unexpended sustenance—here referred to as “the balance”—is by its na-

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ture exactly opposite to that which prudent men desire to hold with their bankers in affairs of finance. In these latter engagements we desire to augment the income, and endeavor to confine expenditure within such limits as to maintain a cash balance in our favor to meet exigencies not perhaps foreseen. But in order to preserve our health when that period of blatant, rampant, irrepressible vigor which belongs to youth has passed away, it is time to see that our income of food and our expenditure through such activity as we have constitute a harmonious equality, or nearly so. A well-hoarded balance of nutritive material now becomes a source of evil, telling against its possessor, and by no means in his favor. And it is a balance which it is so agreeable and so easy to form, and which often so insidiously augments, unless we are on our guard against the danger. The accumulated stores of aliment—the unspent food, so to speak—which saturate the system are happily often got rid of by those special exercises to which so large a portion of time and energy is devoted by some people. It is to this end that men at home use dumb-bells or heavy clubs, or abroad shoot, hunt, and row, or perform athletic and pedestrian feats, or sweat in Turkish baths, or undergo a drench at some foreign watering place—all useful exercises in their way, but pursued to an extent unnecessary for any other purposes than to eliminate superfluous nutrient materials, which are occasioning derangements in the system, for which these

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modes of elimination are sometimes an efficient cure, and thus are often ordered by the medical adviser.

Less Nutriment for the Aged

But as we increase in age—when we have spent, say, our first half-century—less energy and activity remain, and less expenditure can be made; less power to eliminate is possible at fifty than at thirty; still less at sixty and upward. Less nutriment, therefore, must be taken in proportion as age advances, or rather as activity diminishes, or the individual will suffer. If he continues to consume the same abundant breakfasts, substantial lunches, and heavy dinners, which at the summit of his power he could dispose of almost with impunity, he will in time certainly either accumulate fat, or become acquainted with gout or rheumatism, or show signs of unhealthy deposit of some kind in some part of the body, processes which must inevitably empoison, undermine, or shorten his remaining term of life. He must reduce his “intake,” because a smaller expenditure is an enforced condition of existence. At seventy, the man’s power has further diminished, and the nutriment must correspond thereto, if he desires still another term of comfortable life. And why should he not? Then at eighty, with less activity there must be still less “support.” And on this principle he may yet long continue, provided he is not the victim of some inherited taint or vice

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of system too powerful to be dominated, or that no unhappy accident inflicts a lasting injury on the machine, or no unfortunate exposure to insanitary poison has shaken the frame by long, exhausting fever; and then, with a fair constitution, he may remain free from serious troubles, and active to a right good old age, reaching far beyond the conventional seventy years which were formerly supposed to represent the full limit of man's fruitful life and work on earth.

But how opposed is this system to the favorite popular theory. Have we not all been brought up in the belief that the perfection of conduct consists, truly enough, in temperate habits in youth and middle life, such duty, however, being mostly enforced by the pleasant belief that when age arrived we might indulge in that extra "support"—seductive term, often fruitful of mischief—which the feebleness of advancing years is supposed to deserve? The little sensual luxuries, hitherto forbidden, now suggested by the lips of loving woman, and tendered in the confidence of well-doing by affectionate hands, are henceforth to be gracefully accepted, enjoyed, and turned to profit in the evening of our declining years. The extra glass of cordial, the superlatively strong extract of food, are now to become delicate and appropriate aids to the enfeebled frame. Unhappily for this doctrine, it is, on the contrary, precisely at this period that concentrated aliments are not advantageous or wholesome,

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but are to be avoided as sources generally prolific of trouble. If the cordial glass and the rich food are to be enjoyed at any time, whether prudently or otherwise, like other pleasures they must be indulged when strength and activity are great—in other words, when eliminating power is at its maximum; assuredly not when the circulation is becoming slow and feeble and the springs of life are on the ebb. For the flow of blood cannot be driven into any semblance of the youthful torrent by the temporary force of stimulants, nor is it with impunity to be overcharged by the constant addition of rich elements which can no longer be utilized.

And thus it is impossible to deny that an unsuspected source of discomfort, which in time may become disease, sometimes threatens the head of the household—a source which I would gladly pass over, if duty did not compel me to notice it, owing as it is to the sedulous and tender care taken by the devoted, anxious partner of his life, who in secret has long noted and grieved over her lord's declining health and force. She observes that he is now more fatigued than formerly after the labors of the day, is less vigorous for business, for exercise, or for sport, less energetic every way in design and execution. She naturally desires to see him stronger, to sustain the enfeebled power which age is necessarily undermining; and with her there is but one idea, and it is practically embodied in one method—viz., to increase

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his force by augmenting his nourishment! She remonstrates at every meal at what she painfully feels is the insufficient portion of food he consumes. He pleads in excuse, almost with the consciousness of guilt, that he has really eaten all that appetite permits; but he is besought with plaintive voice and affectionate entreaty "to try and take a little more," and, partly to stay the current of gentle complaint, partly to gratify his companion, and partly, as with a faint internal sigh he may confess to himself, "for peace and comfort's sake," he assents, and with some violence to his nature forces his palate to comply, thus adding a slight burden to the already satiated stomach. Or if perchance endowed with a less compliant nature he is churlish enough to decline the proffered advice, and even to question the value of a cup of strong beef tea, or egg whipped up with sherry, which, unsought, has pursued him to his study, or been sent to his office between eleven and twelve of the forenoon, and which he knows by experience must, if swallowed, inevitably impair an appetite for lunch, then not improbably he will fall a victim to his solicitous helpmeet's well-meaning designs in some other shape. There is the tasteless calf's-foot jelly, of which a portion may be surreptitiously introduced into a bowl of tea with small chance that its presence will be detected, especially if accompanied by a good modicum of cream; or the little cup of cocoa or of coffee masking an egg well beaten and smoothly blended to tempt the palate,

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—types of certain small diplomatic exercises, delightful, first, because they are diplomatic and not direct in execution; and, secondly, because the supporting system has been triumphantly maintained, her lord's natural and instinctive objections thereto notwithstanding.

But the loving wife—for whom my sympathy is not more profound than is my sorrow for her almost incurable error in relation to this single department of her duty—is by no means the only source of fallacious counsel to the man whose strength is slowly declining with age. We might almost imagine him to be the object of a conspiracy, so numerous are the temptations which beset him on every side.

Advertised Nostrums

The daily and weekly journals display column after column of advertisements, enumerating all manner of edibles and drinkables, and loudly trumpeting their virtues, the chief of which is always declared to be the abundance of some quality averred to be at once medicinal and nutritious. Is it bread that we are conjured to buy? Then it is warranted to contain some chemical element; let it be, for example, "the phosphates in large proportion"—a mysterious term which the advertising tradesman has for some time past employed to signify a precious element, the very elixir of life, which somehow or other he has led the public

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to associate with the nutriment of the brain and nervous system, and vaunts accordingly. He has evidently caught the notion from the advertising druggist, who loudly declares his special forms of half food, half physic, or his medicated preparations of beef and mutton, to contain the elements of nutrition in the highest form of concentration, among which have mostly figured the aforesaid "phosphates"—as if they were not among the most common and generally prevalent of the earthy constituents of all our food!

Then, lest haply a stomach unaccustomed to the new and highly concentrated materials should, as is not improbable, find itself unequal to the task of digesting and absorbing them, a portion of gastric juice, "pepsin," borrowed for the occasion mostly from the pig, is associated therewith to meet, if possible, that difficulty, and so to introduce the nourishment by hook or by crook into the system. I do not say the method described may not be useful in certain cases, and on the advice of the experienced physician, for a patient exhausted by disease, whose salvation may depend upon the happy combination referred to. But it is the popular belief in the impossibility of having too much of that or of any such good thing, provided only it consists of nutritious food, that the advertiser appeals to, and appeals successfully, and with such effect that the credulous public is being gulled to an enormous extent. A matter of small

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consequence to many, but fraught with mischief to not a few, already the pitiable victims of overfeeding.

Nutritious Drink

Then even our drink must now be nutritious! Most persons might naturally be aware that the primary object of drink is to satisfy thirst, which means a craving for the supply of water to the tissues—the only fluid they demand and utilize when the sensation in question is felt. Water is a solvent of solids, and is more powerful to this end when employed free from admixture with any other solid material. It may be flavored, as in tea and otherwise, without impairing its solvent power, but when mixed with any concrete matter, as in chocolate, thick cocoa, or even with milk, its capacity for dissolving—the very quality for which it was demanded—is in great part lost. So plentiful is nutriment in solid food, that the very last place where we should seek that quality is the drink which accompanies the ordinary meal. Here at least we might hope to be free from an exhortation to nourish ourselves, when desirous only of allaying thirst or moistening our solid morsels with a draught of fluid. Not so; there are even some persons who must wash down their ample slices of roast beef with draughts of new milk!—an unwisely devised combination even for those of active habit, but for men and women whose lives are little occupied by exercise it

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is one of the greatest dietary blunders which can be perpetrated.

One would think it was generally known that milk is a peculiarly nutritive fluid, adapted for the fast growing and fattening young mammal—admirable for such, for our small children, also serviceable to those whose muscular exertion is great, and, when it agrees with the stomach, to those who cannot take meat. For us who have long ago achieved our full growth, and can thrive on solid fare, it is often superfluous and even mischievous as a drink.

Artificial Teeth

Another agent in the combination to maintain for the man of advancing age his career of flesh eater is the dentist. Nothing is more common at this period of life than to hear complaints of indigestion, experienced, so it is affirmed, because mastication is imperfectly performed for want of teeth. The dentist deftly repairs the defective implements, and the important function of chewing the food can be henceforth performed with comfort. But without any intention to justify a doctrine of final causes, I would point out the significant fact that the disappearance of the masticating powers is mostly coincident with the period of life when that species of food which most requires their action—viz., solid animal fiber—is little, if at all, required by the individual. It is during the

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latter third of his career that the softer and lighter foods, such as well-cooked cereals, some light mixed animal and vegetable soups, and also fish, for which teeth are barely necessary, are particularly valuable and appropriate. And the man with imperfect teeth who conforms to Nature's demand for a mild, non-stimulating dietary in advanced years, will mostly be blessed with a better digestion and sounder health than the man who, thanks to his artificial machinery, can eat and does eat as much flesh in quantity and variety as he did in the days of his youth. Far be it from me to undervalue the truly artistic achievements of a clever and experienced dental surgeon, or the comfort which he affords. By all means let us have recourse to his aid when our natural teeth fail, for the purpose of vocal articulation, to say nothing of their relation to personal appearance: on such grounds the artificial substitutes rank among the necessities of life in a civilized community. But it must be also understood that the chief end of teeth, so far as mastication is concerned, is still necessary in advancing age for all the food which has to be taken, whatever it consists of. But I cannot help adding that there are some grounds for the belief that those who have throughout life, from their earliest years, consumed little or no flesh, but have lived on a diet chiefly or wholly vegetarian, will be found to have preserved their teeth longer than those who have always made flesh a prominent part of their daily food.

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The Tailor's Ignorant Flattery

Then there is that occasional visit to the tailor, who, tape in hand, announces in commercial monotone to the listening clerk the various measurements of our girth, and congratulates us on the gradual increase thereof. He never in his life saw you looking so well; and "Fancy, sir, you are another inch below your armpits"—a good deal below—"since last year!" insidiously intimating that in another year or so you will have nearly as fine a chest as Sandow! And you, poor deluded victim, are more than half willing to believe that your increasing size is an equivalent to increasing health and strength, especially as your wife emphatically takes that view, and regards your augmenting portliness with approval. Ten years have now passed away since you were forty and by weight twelve stone and a half—a fair proportion for your height and build. Now you turn the scale to one stone more, every ounce of which is fat: extra weight to be carried through all the labors of life. If you continue your present dietary and habits, and live five or seven years more, the burden of fat will be doubled; and that insinuating tailor will be still congratulating you.

Disasters of Corpulence

Meantime, you are "running the race of life"—a figure of speech less appropriate to you at the present

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moment than it formerly was—handicapped by a weight which makes active movement difficult, upstairs troublesome, respiration thick and panting. Not one man in fifty lives to a good old age in this condition. The typical man of eighty or ninety years, still retaining a respectable amount of energy of body and mind, is lean and spare and lives on slender rations. Neither your heart nor your lungs can act easily and healthily, being oppressed by the gradually gathering fat around. And this because you continue to eat and drink as you did, or probably more luxuriously than you did, when youth and activity enabled you to dispose of that moiety of food which was consumed over and above what the body required for sustenance. Such is the import of that balance of unexpended aliment which your tailor and your foolish friends admire, and the gradual disappearance of which, should you recover your senses and diminish it, they will still deplore, half frightening you back to your old habits again by saying, “You are growing thin; *what can be the matter with you?*” Insane and mischievous delusion!

CHAPTER II

IT must now be clearly understood, as a universally applicable rule for men at all ages, that the amount of food ingested ought to accord, within certain narrow limits, with the amount of force employed for the purposes of daily life. But there is a certain qualification, apparent but not real, of the principle thus enunciated, which must be referred to here in order to prevent misunderstanding or misinterpretation of my meaning in relation to one particular. It is right and fitting that a certain amount of storage material, or balance, should exist as a reserve in the constitution of every healthy man. Every healthy individual, indeed, necessarily possesses a stored amount of force, which will stand him in good stead when a demand arises for prolonged unusual exertion, or when any period of enforced starvation occurs, as during a lingering fever or other exhausting disease. The existence of this natural and healthy amount of reserved force is, of course, presupposed throughout all my remarks, and its value is taken for granted. It is abundantly present in every obviously well-nourished and healthy man. That undue amount of stored nutriment, that balance which has been referred to

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as prejudicial to the individual, is a quantity over and above the natural small reserve which exists in health; for when augmented beyond that point, the material takes the form of diseased deposit, and ceases to be an available source of nutriment. Even the natural amount of store or reserve is prone to exceed the necessary limit in those who are healthy or nearly so.

"Training" and Loss of Weight

Hence it is that in all systems of training for athletic exploits—which is simply a process of acquiring the highest degree of health and strength attainable, in view of great or prolonged exertion—some loss of weight is almost invariably incurred in developing a perfect condition. In other words, almost any man who sets himself to acquire by every means in his power the best health possible for his system, does, in the process necessary thereto, throw off redundant materials, the presence of which is not consistent with the high standard of function required. On the other hand, what is sometimes called "overtraining" is a condition in which the storage is reduced too much, and some weakening is incurred thereby; while "undertraining" implies that the useless fatty and other matters have not been sufficiently got rid of, so that the athlete is encumbered by unnecessary weight, and is liable to needless embarrassments, telling against his chances in more ways than

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one. The exact and precise balance between the two conditions is the aim of the judicious trainer.

We are thus led to the next important consideration, namely, that although broad rules or principles of diet may be enunciated as applicable to different classes of people in general, no accurate adaptation to the individual is possible without a knowledge of his daily habits and life, as well as to some extent of his personal peculiarities. No man, for example, can tell another what he can or ought to eat, without knowing what are the habits of life and work—mental and bodily—of the person to be advised. Notwithstanding which, no kind of counsel is more frequently tendered in common conversation by one stranger with another than that which concerns the choice of food and drink. The adviser feels himself warranted, by the experience that some particular combination of nourishment suits his own stomach, to infer without hesitation that this dish will be therefore acceptable to the stomachs of all his neighbors. Surely the intelligence of such a man is as slender as his audacity and presumption are large. It would not be more preposterous if, having with infinite pains obtained a last representing precisely the size and the peculiarities in form of his own foot, he forthwith solemnly adjured all other persons to adopt boots made upon that model, and on none other! Only it may be confidently assumed that there is much more difference between stomachs and their needs among different individuals,

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than among the inferior extremities referred to for the purpose of illustration. Thus, in regard to expenditure of food, how great is the difference between that of a man who spends ten or twelve hours of the day at the work of a navvy, as an agricultural laborer in harvest time, or in draining or trenching land, as a sawyer, a railway porter, or a bricklayer's laborer, or, let me add, that of an ardent sportsman, as compared with the expenditure of a clerk who is seated at the desk, of individuals engaged in literary and artistic pursuits, demanding a life mostly sedentary and spent indoors, with no exercise but that which such persons voluntarily take as a homage to hygienic duty, and for a short period borrowed at some cost from engagements which claim most of their time and nearly all their energies. While the manual laborers rarely consume more food than they expend, and are, if not injured by drink, or by undue exposure to the weather, mostly hale and hearty in consequence, the latter are often martyrs to continued minor ailments, which gradually increase, and make work difficult and life dreary.

Light Dietary for Brain Workers

Few people will believe how easy it is in most instances to avoid these stomach derangements and their results by adopting appropriate food, and that such brain workers can really enjoy a fair degree

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of health and comfort by living on light food, which does not require much force to digest, and much muscular activity to assimilate. A diet, moreover, which is important to some of these from another point of view—the financial one—inasmuch as it is at least less costly by one-half than the conventional meals which uniform personal habits or social customs prescribe alike to large classes of men in varied conditions of life. But there is another and more important economic gain yet to be named, as realizable through the use of a light and simple dietary. It is manifested by the fact that a greater expenditure of nerve power is demanded for the digestion of heavy meals than for that of the lighter repasts which are suitable to the sedentary; from which fact it results, of course, that in the latter case this precious power is reserved for more useful and more delightful pursuits than that of mere digestion, especially when this function is not too well performed.

Exercise and Fresh Air

But those who have little time for exercise, and are compelled to live chiefly within doors, must endeavor also to secure, or should have secured for them as far as possible by employers, by way of compensation, a regular supply of fresh air without draughts, an atmosphere as free from dust and other impurities as can be obtained, with a good supply of light, and

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some artificial warmth when needed. These necessities granted, cereal foods, such as well-made bread, in variety, and vegetable produce, including fruits, should form a fair portion of the diet consumed, with the addition of eggs and milk if no meat is taken, except in the form of soup, and little of other animal food than fish, fowl, and game. On such a dietary, and without alcoholic stimulants, thousands of such workers as I have briefly indicated may enjoy with very little exercise far better health and more strength than at present they experience on meat and heavy puddings, beer, baker's bread, and cheese. Of course there are workers who belong to neither of the two extreme classes indicated, and whose habits cannot be described as sedentary, but who occupy a middle place between the two. For such, some corresponding modification of the dietary is naturally appropriate.

Temperature and Food

A brief allusion must be made to the well-known and obvious fact that the surrounding temperature influences the demand for food, which therefore should be determined as regards quantity or kind according to the climate inhabited, or the season of the year as it affects each climate. In hot weather the dietary should be lighter, in the understood sense of the term, than in cold weather. The sultry period of our summer, although comparatively slight and of short

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duration, is nevertheless felt by some persons to be extremely oppressive; but this is mainly due to the practice of eating much animal food or fatty matters, conjoined as it often is with the habit of drinking freely of fluids containing more or less of alcohol. Living on cereals, vegetables, and fruit, with some proportion of fish, and abstaining from alcoholic drinks, the same persons would probably enjoy the high temperature, and be free from the thirst which is the natural result of consuming needlessly substantial and heating food.

There is a very common term, familiar by daily use, conveying unmistakably to everyone painful impressions regarding those who manifest the discomforts indicated by it—I mean the term “indigestion.” The first sign of what is so called may appear even in childhood; not being the consequence of any stomach disorder, but solely of some error in diet, mostly the result of eating too freely of rich compounds in which sugar and fatty matters are largely present. These elements would not be objectionable if they formed part of a regular meal, instead of being consumed, as they mostly are, between meals, already abounding in every necessary constituent. For both sugar and fat are elements of value in children’s food, and naturally form a considerable portion of it, entering largely into the composition of milk, which Nature supplies for the young and growing animal.

In children, an attack of indigestion mostly ter-

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minates rapidly by ejection of the offending matter. But the indigestion of the adult is less acutely felt and is less readily disposed of. Uneasiness and incapacity for action, persisting for some time after an ordinary meal, indicate that the stomach is acting imperfectly on the materials which have been put into it. These signs manifest themselves frequently, and, if Nature's hints that the food is inappropriate are not taken, they become more serious. Temporary relief is easily obtained by medicine; but if the unfortunate individual continues to blame his stomach, and not the dietary he selects, the chances are that his troubles will continue, or appear in some other form. At length, if unenlightened on the subject, he becomes "a martyr to indigestion," and resigns himself to the unhappy fate, as he terms it, of "the confirmed dyspeptic."

"Indigestion" a Natural Result of Errors

Such a victim may perhaps be surprised to learn that nine out of ten persons so affected are probably not the subjects of any complaint whatever, and that the stomach at any rate is by no means necessarily faulty in its action—in short, that what is popularly termed "indigestion" is rarely a disease in any sense of the word, but merely the natural result of errors in diet. For most men it is the penalty of conformity to the eating habits of the majority; and a want

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of disposition or of enterprise to undertake a trial of simpler foods than those around them consume probably determines the continuance of their unhappy troubles. In many instances it must be confessed that the complaint, if so it must be called, results from error, not in the quality of the food taken, but in the quantity. Eating is an agreeable process for most people, and under the influence of very small temptation, or through undue variety furnishing a source of provocation to the palate, a considerable proportion of nutritious material above what is required by the system is apt to be swallowed.

Variation of Stomachs

Then it is also to be remembered that stomachs which vary greatly in their capacity and power to digest may all nevertheless be equally healthy and competent to exercise every necessary function. In like manner we know that human brains which are equally sound and healthy often differ vastly in power and in activity. Thus a stomach which would be slandered by a charge of incompetence to perform easily all that it is in duty bound to accomplish, may be completely incapable of digesting a small excess beyond that natural limit. Hence, with such an organ indigestion is inevitable when this limit is only slightly exceeded. And so when temptations are considerable, and frequently complied with, the disturbance may be,

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as it is with some, very serious in degree. How very powerful a human stomach may sometimes be, and how large a task in the way of digestion it may sometimes perform without complaint, is known to those who have had the opportunity of observing what certain persons with exceptional power are accustomed to take as food, and do take for a long time apparently with impunity. But these are stomachs endowed with extraordinary energy, and woe be to the individual with a digestive apparatus of moderate power who attempts to emulate the performance of a neighbor at table who perchance may be furnished with such an effective digestive apparatus.

After all, let not the weaker man grieve overmuch at the uneven lot which the gods seem to have provided for mortals here below in regard to this function of digestion. There is a compensation for him which he has not considered, or perhaps even heard of, although he has been so moderately endowed with peptic force. A delicate stomach which can just do needful work for the system and no more, by necessity performs the function of a careful door porter at the entrance of the system, and like a jealous guardian inspects with discernment all who aspire to enter the interior, rejecting the unfit and the unbidden, and all the common herd.

On the other hand, a stomach with superfluous power, of whom its master boastfully declaims that it can "digest tenpenny nails," and that he is un-

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of disposition or of enterprise to undertake a trial of simpler foods than those around them consume probably determines the continuance of their unhappy troubles. In many instances it must be confessed that the complaint, if so it must be called, results from error, not in the quality of the food taken, but in the quantity. Eating is an agreeable process for most people, and under the influence of very small temptation, or through undue variety furnishing a source of provocation to the palate, a considerable proportion of nutritious material above what is required by the system is apt to be swallowed.

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impressionable brain, with a susceptible stomach possessing only moderate digestive capabilities—sources altogether beyond the imagination of many a coarse feeder and capable digester.

But is not correct, and it is on all grounds undesirable, to regard the less powerful man as a sufferer from indigestion, that is, as liable to any complaint to be so termed. True indigestion, as a manifestation of diseased stomach, is comparatively quite rare, and I have not one word to say of it here, which would not be the fitting place if I had. Not one person in a hundred who complains of indigestion has any morbid affection of the organs engaged in assimilating his food; unless a temporary one, occasioned by over-indulgence.

Indigestion Mostly Not Disease

As commonly employed, the word "indigestion" denotes, not a disease, but an admonition. It is the language of the stomach, and is mostly an unknown tongue to those who are addressed. Few even listen to the cry, much less imagine that it bears a message of importance. It means, however, that the individual thus admonished has not yet found his appropriate diet: that he takes food unsuited for him, or too much of it. The food may be "wholesome enough in itself," a popular phrase permitted to appear here, first, because it conveys a meaning perceived by everyone, although the idea is loosely expressed; but

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secondly, and chiefly, for the purpose of pointing out the fallacy which underlies it. There is no food whatever which is "wholesome in itself"; and there is no fact which people in general are more slow to comprehend. That food only is wholesome which is so to the individual; and no food can be wholesome to any given number of persons. Milk, for example, may agree admirably with me, and may as certainly invariably provoke an indigestion for my neighbor; and the same may be said of almost every article of our ordinary dietary. The wholesomeness of a food consists solely in its adaptability to the individual, and this relation is governed mainly by the influences of his age, activity, surroundings, and temperament or personal peculiarities.

Indigestion, therefore, does not necessarily, or indeed often, require medicine for its removal. Drugs, and especially small portions of alcoholic spirit, are often used for the purpose of stimulating the stomach temporarily to perform a larger share of work than by nature it is qualified to undertake; a course which is disadvantageous for the individual if persisted in. The effect on the stomach is that of the spur on the horse; it accelerates the pace, but "it takes it out" of the animal; and if the practice is long continued, shortens his natural term of efficiency.

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A "Light Dietary" Often Palatable

It is an erroneous idea that a simple form of dietary, such as the vegetable kingdom in the largest sense of the term furnishes, in conjunction with a moderate proportion of the most easily digested forms of animal food, may not be appetizing and agreeable to the palate. On the contrary, I am prepared to maintain that it may be easily served in forms highly attractive, not only to the general but to a cultivated taste. A preference for the high flavors and stimulating scents peculiar to the flesh of vertebrate animals, mostly subsides after a fair trial of milder foods when supplied in variety. And it is an experience almost universally allowed, that the desire for food is keener, that the satisfaction in gratifying appetite is greater and more enjoyable, on the part of the general light feeder, than with the almost exclusively flesh feeder. For this latter designation is applicable to almost all those who compose the middle-class population of this country. They consume little bread and few vegetables; all the savory dishes are of flesh, with decoctions of flesh alone for soup. The sweets are compounds of suet, lard, butter, eggs, and milk, with very small quantities of flour, rice, arrow-root, etc.—which comprise all the vegetable constituents—besides some fruit and sugar. Three-fourths at least of the nutrient matters consumed are from the animal kingdom. A reversal of the proportions indicated,

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that is, a fourth only from the latter source with three-fourths of vegetable produce, would furnish greater variety for the table, tend to maintain a cleaner palate, increased zest for food, a lighter and more active brain, and a better state of health for most people not engaged in the most laborious employments of active life. While for those who are so occupied the same proportion amply suffices, and, with due choice of material, even that amount of animal food might be diminished, probably sometimes with advantage. For inactive, sedentary, and aged persons the small proportion of animal food indicated might be considerably lessened with beneficial result. I am frequently told by individuals of sixty years and upward that they have no recollection of any previous period since reaching mature age at which they have possessed a keener relish for food than that which they enjoy at least once or twice a day since they have adopted the dietary thus described. Such an appetite at all events as had rarely offered itself during years preceding, when the choice of food was conventionally limited to the unvarying progression and array of mutton and beef, in joint, chop, and steak, arriving after a strong meat soup, with a possible interlude of fish, and followed by puddings of which the ingredients are chiefly derived from the animal sources.

CHAPTER III

LET me commence this portion of my work¹ by stating that I advise, more emphatically than ever, simplicity in diet; by which is to be understood, that not only is the quantity of food taken to be gradually diminished in proportion to decreased activity of body and mind, but that not more than two or three different forms of food should be served at any one meal. There is no objection to variety in the choice of our provisions. On the contrary, it is neither necessary or desirable to make use of the same kinds of aliment every day. Moreover, these necessarily vary considerably with the season of the year, both in the animal and vegetable kingdoms. And from the profusion which Nature provides should be selected those which each individual, at the time of life supposed, has discovered, by personal experience or otherwise, to agree best with his constitution. I say advisedly "with his constitution," rather than with his stomach. For it should be observed there are notable examples of the stomach digesting easily materials highly injurious to the constitution. It will suffice to name one important

¹ Written fifteen years after Chapters I and II, in the author's eighty-second year.—EDITOR.

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and not uncommon example here, viz., that in which many persons so readily digest and assimilate fatty or fat-forming elements in their food, and become unduly corpulent in consequence. Such a condition should be avoided as most undesirable in advancing years, and as one of the most certain to prevent longevity and give rise to complaints which entail discomfort and even suffering during the latter period of life.

No One Need Be Corpulent

No one should permit himself to become the subject of obesity in advancing years; and almost invariably it is his own fault if he does. The prevention may be insured by largely reducing the use of fatty foods, as fat of meat, bacon, ham, etc., by renouncing all pastry which contains that element largely; also cream, and much milk, as well as all starchy matter, which abounds in the potato and other farinaceous products of the vegetable kingdom; and especially in those combinations so popular and so universally met with at the family table, as rice, sago, tapioca, and corn-flour puddings, made with milk and eggs, of which the yolks contain much fat, the whole being sweetened with sugar—a combination of “carbohydrates” of the most fattening kind. Admirable for childhood and middle life, and afterwards, during the years of maximum activity, they must be completely renounced, if corpulence appears in later life. In this condition also large quan-

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tities of liquid are undesirable at meals; indeed, no liquid should be taken during the meal, and only in moderate quantity soon after it. If any wine is taken, it should be a light Moselle, while ale or beer in any form is wholly inadmissible. Pure water alone is probably the best, or as used in tea, coffee, and cocoa nibs.

The Proper Mode of Eating

Respecting the act of eating itself, it is desirable to add a few words here. Not many persons learn the importance of performing it rightly in youth and middle life. Indeed, it ought to be taught among other elementary lessons in physiology at every school in early life; a short course of which would be much more important and far more interesting than some of the other courses which the existing curriculum contains. I mean by this, a simple description of the chief internal organs connected with digestion and how they act. Every child at eight or ten years of age should know what becomes of his bread and butter, and of his meat, when he gets it. I can scarcely conceive a better subject than this for a simple and entertaining talk to a class of these young people, with a diagram on the wall, showing the chief organs contained in the chest and abdomen. Another chat, about respiration and the circulation of the blood, would follow at a later period. The subject is regarded with suspicion by the public, from the imposing effect of

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the five-syllabled Greek term "physiology," which suggests the idea that I propose to teach young children "science!"—as if that term, let me remark, whenever it is used, denoted anything more than an "*exact* knowledge respecting the matter in hand." The process of masticating affects the food in two ways, during the period it is retained in the mouth, before the act of swallowing takes place.

Complete Division of Food

First, it is essential that all food, whether formed of meat, fish, bread, or vegetable, should be thoroughly divided into minute fragments by the teeth, so that, first, the animal portion may be properly subjected to the action of the gastric juice when it arrives at the stomach; secondly, because for all starchy foods, already spoken of as the carbohydrates, complete and prolonged mastication is, if possible, even more necessary, although they are generally soft and easily swallowed. For the act of mastication excites a constant flow of saliva into the mouth, secreted by numerous adjacent glands—a fluid containing a specific chemical agent, known as "ptyalin," by means of which the actual process of digestion is performed in the mouth, of all the starchy products—which are completely insoluble in water—converting them into "glucose," which is quite soluble, and on being swallowed they can therefore be absorbed as soon as they

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reach the stomach. This fact should never be forgotten, that the mouth is the cavity in which that large portion of our food which consists of bread and farinaceous foods and vegetable tubers ought to be digested by means of mastication and insalivation—i. e., thorough mixing with the saliva. If, however, this process be neglected, as unhappily is too often the case, the stomach, which is capable of digesting animal food only, of course including milk and eggs, and has no power whatever to digest starchy matters, is liable to be deranged by the presence of much undigested bread and pudding, which, if not well masticated, must be detained there until the animal products are dissolved, when the entire contents reach the small intestine (duodenum), where digestion of the starchy matters is effected by contact with the pancreatic juice, which renders them soluble and capable of being absorbed as nourishment to the system.

Drinking During Meals

It will be appropriate here to revert to a subject already referred to when treating of obesity, viz., that of not drinking during meals. This practice has also the advantage of enforcing the remarks already made. The habit of imbibing our fluids during the progress of a meal, whether it be breakfast, dinner, tea, or supper, is almost universal. In this manner, from half a pint to a pint and a half are thus consumed at a single

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meal; hence much of the solid matter eaten is unconsciously carried down into the stomach unmasticated, and the farinaceous foods, especially at breakfast where they abound, are undigested. Whether the fluids consist of hot tea and coffee, cold water or wine, more or less diluted, the result is, that the food is apt to reach the stomach imperfectly masticated. The only legitimate mode, as I have shown, is to masticate every morsel until it becomes a soft pultaceous mass, and is easily swallowed in consequence, unaided by drink. If this rule be observed, the meal, if wholesome in kind and in quantity, will be easily and rapidly disposed of in the stomach; and after all is finished, let the tea or coffee be enjoyed by itself. The popular mode of alternately sipping fluid and eating is a difficult one to break; but it is merely a bad habit, and by perseverance can be exchanged for a good one. And when one has a healthy appetite for solid food at meal times, drink is never desired, at any rate to begin with. A certain amount is required to meet the demands of the body, for it has been calculated that an average adult requires nearly two and a half pints of water daily, which may be in the form of tea, coffee, aerated drinks, or otherwise, according to his pleasure; and in this way water is regarded as a true food.¹

¹ It should be borne in mind that water is an integral part of the tissues of the body, two-thirds of the weight of every individual being water. All the solid food we eat contains about half its weight of water. Water is not absorbed by the stomach, but is expelled by the pylorus (its lower valvular outlet) into the small intestine, from which it is taken up

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Number of Meals Daily

The number of meals in the day is, to some extent, a question of engagements and of previous habits. In advanced years four small meals are generally better than three. Nothing should ever be eaten between them. Prior to these meals, however, I have myself derived great advantage, for twenty or thirty years at least, from taking a full-sized breakfast cup of *weak* tea, containing about one-fourth of milk—always, of course, sterilized or boiled—every morning at six o'clock, while in bed, and never miss it. Nothing is easier than to make this oneself; it should never be left to servants. Close to the bedside, a small side table is placed overnight with a tray upon it, containing an ordinary Etna, holding fully ten ounces of water, with an appropriate measure of wood spirit, in a little bottle at its side. The milk is put into the cup and covered from dust. A small teaspoonful of tea is placed in a silver wire cage with a hook, by which it is attached to the brim of the Etna, and by which it is suspended in the water when it boils, leaving it there, say, three or four minutes only, and then removing it.

into the blood; and the hotter it is, the more rapidly it is ejected, thus promoting the peristaltic action of the bowels. (*Vide* "Food and the Principles of Dietetics," p. 299 *et seq.*, by Robert Hutchison, M.D., M.R.C.P.) This, in fact, is one of the principles on which the so-called "hot-water cure" is based. And the temperature of the water, which should be slowly sipped, may be as high as 130° F.

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Temperature of Hot Liquids

The contents are poured into the cup, which is now quite full, and the hot tea should be slowly sipped until finished, without the addition of anything whatever to eat. For those who breakfast at a later hour than myself (8.30), this morning tea can be taken correspondingly later, but in any case should be taken at least an hour and a half before the first meal of the day. For many years I have been accustomed to write for an hour every morning in bed after the tea, as I am doing at this moment, and at no time do I find the brain clearer for work, while the appetite for solid food is excellent when the hour for breakfast arrives. The temperature at which to take hot drinks is by no means unimportant. Few persons are aware that they habitually swallow hot liquids, tea especially, at a temperature which, if applied to the hands or feet, would inflict painful scalds. Most tea drinkers take it about 140° to 145° F., which the mouth bears very well if slowly sipped, while the cup itself is too hot to be held by any hand. But the habit of swallowing such tea is injurious to the stomach, and it ought not to be taken above 130° or so. Again, water at 120° , which feels little more than lukewarm in the mouth, causes severe pain if the hand is dipped in it, and cannot be endured. Then, no one can take a footbath above 112° , very few at that, and only after long-continued habitual use— 110° can only

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be borne usually, and ought to suffice. A hot bath for the entire body is generally taken at from 98° to 100°, although it may be sometimes gradually raised to 105° with advantage; and this I am convinced ought rarely to be exceeded.

Dietetics in Detail

I now approach the subject of Dietetics in detail. First, however, let me assume that the ideal personage here advised is entering his eighth decade, or, perhaps, has passed halfway through it—that he is of average size and weight, and has little or no tendency to corpulence. If he has, he must omit some of the foods already pointed out under the head of Obesity, as unfit for those who are afflicted with it. It will be assumed also that he is capable of taking bodily exercise in the open air at least once daily; of walking, say, five, four, or three miles at a stretch, according to his age, and that he does so. That his mind is also actively employed more or less every day: possibly, in some form of literary work, or of professional, commercial, political, or other engrossing activity. For it is very undesirable to be without occupation, and it should be one that involves personal exertions of some kind during a portion of every day. To add, that some gentle use of the muscles of the arms and back should be insured every morning, for a few minutes before dressing, by light clubs or dumb-

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bells, will suffice for the subject of indoor physical exercise.

Exercise Out of Doors

Relative to outdoor exercise, this is essentially necessary to the preservation of health in advancing years; and, further, to state that the amount of walking should be sufficient to accelerate the circulation and produce some action of the skin, as denoted by gentle perspiration. A favorite and often admirable mode of taking it is, no doubt, that known as "the old gentleman's cob," who, if a wholly trustworthy beast, may be both a useful servant and a friend. Moreover, wet weather should not be an excuse for omitting out-of-door exercise. A long waterproof coat and an umbrella should be used, and boots may be kept dry by goloshes or be changed on returning, if necessary; no risk is then incurred. As our subject is "Diet in Relation to Age and Activity," it was necessary to define the last-named condition, to a certain extent, before considering the subject of food.

System for Meals

With these preliminary observations, I now approach the subject of Dietetics in detail. I advise as a typical system, which can be varied according to the circumstances and personal idiosyncrasies of the

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individual, four small meals in the day. Breakfast, say, about 8.30, after hot weak tea and milk before rising; lunch about 1 or 1.15; dinner at 7 or 7.30; and a little refreshment about 11, if required.

Following this course, the animal food supplied for breakfast and at lunch may include an egg or fish cooked in various well-known ways. At lunch, a little tender meat or fowl may be taken, unless it is preferred to reserve them for dinner, in which case fish and a farinaceous pudding may be substituted. This last-named meal should generally commence with a little good *consommé*; often substituting a vegetable *purée*, varying with the season, and made with a light meat stock or broth; or a good fish soup as a change. Then a little fowl (or game) and a dish of vegetable, according to the time of year. Finally, perhaps, some light farinaceous pudding, with or without fruit, should close the meal, which is to be a light one in regard to quantity. Lastly, supper: a very light refreshment may be advantageously taken the very last thing before entering bed, at about eleven or so, as it favors sleep. All animals feed before resting for the night. Few meals are more undesirable for man than a heavy supper, which severely taxes digestion. But elderly men, especially, require some easily digested food to support them during the long fast of night. It is well known that the forces of the body are at their minimum at 4 or 5 A.M.; and this may be well provided for by taking about five or six ounces of

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consommé with one ounce of thin toasted bread, served in the bedroom, as above said.

Of bread eaten with meals it may be said that whether brown or white it should be toasted; the white, as containing most starch, should be toasted thoroughly, so as to be quite brittle, and show the brown color extending through its interior; the starch is thus converted into glucose which is soluble. Quantity during the meal: from three to five ounces of the bread before toasting it, which, of course, diminishes the weight. Fresh butter is the most generally wholesome of all fatty matters which come to table; about three to four ounces may be taken daily, of course including that which is used in cooking.

Drink: very weak tea is generally the best at breakfast, with a good proportion of milk; and with sugar, if it agrees. This is not to be taken very hot, for reasons already named, and about five minutes after the conclusion of the meal. At lunch, the drink may include a breakfast cup of coffee with milk; or a draught, if desired, of pure distilled aerated water, either to be taken after the meal. The question of wine and spirits will be discussed in its place hereafter.

Occupation for Forenoon

Occupation: after breakfast. Two hours at least of some quiet sedentary occupation should follow this meal; after which an hour or a little more should

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be devoted to outdoor exercise. As age advances, say at eighty or upward, it is often advisable, by no means always, to find a seat somewhere after the first half hour or more—such as are provided in all the London parks—and rest for a quarter of an hour, to enjoy as much fresh air as possible before returning by the same or by another and, perhaps, extended route. But it should be a rule to reach home twenty or thirty minutes before lunch, during which period, rest—best in the recumbent position—should be maintained, as a desirable preparation for the coming meal. An hour and a half's rest at least should follow lunch, when a portion of the afternoon should be spent driving in fresh air, if possible, or in visiting friends; and at one's club, where the billiard room offers gentle exercise, if the condition of the eyesight permits; if not, a quiet rubber or two should be always within reach, and be enjoyed as a special resource of age.

Here also may be found the daily journals with the news of the day; often doubtless too much read, but containing not a little that is necessary to be known concerning the wide world in its course. Moreover, if it be a club of the first rank, it will contain a collection of encyclopedic works, English and foreign, for reference, and for research on all subjects, so necessary to every man of intelligence. Then it is also a treasure-house of standard classical literature, that of our own country during the last two or three centuries, with some of the best examples of foreign

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authors, besides the ancient "classics," specifically so termed. Besides these, a large collection of ancient and modern works of fiction, or what is known as "light reading" for leisure hours. Among these we shall probably find the admired masters of the past, whom perchance we read in our youth, a great resource now; and that some of these are more highly appreciated, understood, and enjoyed, reread as they are with the matured knowledge of the world which comes with age. Perhaps there is no man, however active and hard-working in the past, who has not found a great and necessary relief in spending what would otherwise be tedious hours, over works of fiction, new and old favorites treasured in his own library at home.

Smoking

"Our club" suggests the smoking room, and a very few words about that habit will suffice. The only persons who enjoy the practice, and find it tranquilizing at times, are those who smoke in great moderation. Men who certainly do not enjoy it, and have long ceased to do so, are those who are rarely seen either here or elsewhere without a cigar between their lips. To have one there has become a confirmed habit, which is followed by the natural result that they are merely miserable when the cigar is absent. That much smoking endangers the eyesight and occasions a chronic disease of the throat is not to be forgotten.

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Five O'clock Tea

A cup of weak tea may be taken at the usual "five o'clock tea," but not a single morsel of solid food. Nothing can be more undesirable, not to use a stronger term, than the practice of eating then; especially of the sweet and unwholesome dainties of every description which are offered to visitors at this popular hour among ladies when receiving their friends; a repast which practically takes place about two hours before dinner, at which time the stomach should be completely at rest in view of that meal so near at hand.

CHAPTER IV

THE question of alcoholic drink has to be considered. I believe all intelligent persons will agree in believing that the consumption of alcoholic liquors (beer, wine, and spirits) by people in general greatly exceeds that which is desirable for health. Having been myself what is known as "a moderate drinker" up to about fifty-two years of age, my own experience, and large opportunities of observing that of others, compelled me some twenty years ago to come to the conclusion that most of those patients who suffered from indigestion, or from what they termed "rheumatism, gout," etc.,¹ were greatly improved in health by appropriate diet and some simple treatment; and that many were permanently cured, provided that they discontinued the use of alcoholic drinks altogether.

Wine in Old Age

In the original editions, constituting what is now called the "First Part" of this little work, the view

¹ These terms have little real meaning as popularly used, and express no other fact than the existence of pain and stiffness in the joints or elsewhere; but they indicate the necessity for a careful inquiry into the patient's general condition and habits, so that a diagnosis of his complaint may be made.

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of abstinence from alcoholic liquors just enunciated was taken for granted. Here, in the "Second Part," where details are given respecting diet and habits of various kinds conducive to longevity and to the prevention of disease at the same time, a fuller consideration of the subject is necessary. Further, it is well known that a popular idea respecting the value of alcohol to elderly men has existed, time out of mind, expressed by the quaint saying, "Wine is the milk of old age." Desirous of testing this allegation at all events—and I confess with a faint hope that there might be some truth in it for myself—I made the experiment some five or six years ago of taking, during a period of about two months, a single claret glass—say three ounces—of good wine every day at dinner only. But I was compelled to give it up, as I felt unmistakable signs of the return of pain and stiffness in the joints, together with the recurrence of sick headaches, from which I had suffered severely for many years before. For these I had at that early date obtained no relief, notwithstanding much treatment, until I abstained entirely from alcoholic drinks, when, after a few months, I lost my local pains and the sick headaches completely. Moreover, the joints gradually lost their stiffness and ultimately became as supple and mobile as they were in youth, and continue absolutely so until this day.¹ It may be fairly said in reply

¹ This is not an extravagant use of language, but a well-considered statement, capable of verification, and is no less so now (January, 1903).

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that one example does not suffice to prove a case. But it is not a single example, and really designates a very large class of active men among all ranks, possessing a more or less similar temperament, of which a type is here described, and it is for such that I have found it so successful.

Special Notes on Bathing

The habit of daily bathing and washing in various forms demands a paragraph. I shall presume that most, if not all, octogenarians have passed the age at which the early morning cold bath can be enjoyed all the year round. For all general purposes of bathing in the bedroom, a fairly deep and capacious hipbath is, I think, the best form. This, in cold weather, should be filled with water overnight, and remain in the bedroom to acquire its temperature. Then the head should be thoroughly sluiced on first rising, while kneeling down before it, not *stooping* over the bath. This is a refreshing exercise before dressing, and should be followed by a dry rub all over. Then, say twice a week, for the last-named dry rubbing may be substituted friction over the whole body with a towel wrung out of hot water once or twice; or by taking a hipbath at 100° or 102° F., for five minutes with a good sponging all over; if in winter, of course, before a fire.

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Hot Baths

Then, once a week, or ten days at least, a hot bath should be taken, if there is one closely adjoining the bedroom; if not, it can be easily managed in the hipbath described. Respecting this procedure, I have to recommend a plan adopted by me during the last ten or twelve years with very useful results. It should be remembered that the skin always tends to become drier and harsher in advanced age, and therefore acts less freely as an excreting organ, which it is—a large and very important one. The true skin, indeed, is largely made up of minute capillary blood vessels which lie closely beneath the surface of the dry cuticle. These gradually become diminished, and the circulation through them less active; a condition partially remedied by daily exercise, alluded to on a former page. The bath, commencing say at 99° , should gradually be brought up to 104° or 105° , for two, three, or four minutes, as advised above. The skin becomes more or less reddened, and a very pleasurable sense of comfort is produced by the augmented circulation set up through the entire surface. Soap should now be freely used to every part of it, aided by a soft flesh brush, and should be washed off with water of the same high temperature. Then leaving the bath, the surface of the body should be well rubbed and dried with a large sheet of thick white toweling which completely covers it. When this is accom-

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plished, the bather should now thoroughly rub into every part of the surface of the body, using the palm of the hand for the purpose, some pure olive oil (salad oil), say a teaspoonful at a time, especially into those regions where the skin is drier and thicker than the rest, as on the outer sides of the thighs and hips. An ounce (two tablespoonfuls) at least should be thus employed. The ancient Romans, who spent so much time in the hot bath as a luxury, well knew the value of applying oil afterwards to replace the loss of the natural secretion of the skin occasioned by prolonged immersion in hot water, and used it largely for the purpose. The natural supply of moisture during the prime of life is gradually diminished by age; but a greatly improved condition of the skin may be secured by the proceeding described. Under such treatment it becomes supple and healthy, and at the close of the performance some five minutes should be devoted to gentle calisthenic exercises, to bring into action as far as possible all the muscles of the body.

The Nightly Footbath

There is another mode of using hot water, an exceedingly valuable one, which must be mentioned here. It is the habit of taking a hot footbath every night before going to bed, for about ten or twelve minutes as hot as it can be borne. I have done this for thirty years, no matter how late the hour to which social

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or professional engagements have delayed my return home. Indeed, the more prolonged or the more engrossing these have been, the more need is there for the hot footbath. The effect of this on the feet, which should be immersed over the ankle, is to fill their vessels with blood—rendered apparent by their deep red color—and this affords relief, by withdrawing it from the brain. Especially after intellectual activity resulting from public life, etc., as above referred to, also after prolonged study or literary labor at night, the tranquilizing effect on the nervous system is very remarkable, and quiet sleep is promoted. Let the highest temperature which can be borne be maintained for at least ten minutes by repeated small additions from the hot-water can close at hand. Probably, at first, 106° or 108° may be the limit of endurance. From long habitude, I use it at 108° or 110° . A brief wash with soap may be made at finishing before well rubbing dry. A secondary advantage of the practice advised is that the condition of the feet will become as good as that of the hands; and if boots of proper form are worn, i. e., as wide as the foot and not pointed, each toe will be separate and mobile as it should be, not overlapping and deformed; and half hose made with separate digits for each toe, or at least like mittens, with one compartment for the great toe, may be worn with advantage, as my long experience can testify.¹

¹ Both made by Jaeger & Co., and I believe not elsewhere. I continue their use to the present day (1903).

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Turkish Baths

Turkish baths should be named. No doubt these are very serviceable to many people during the prime of life and afterwards; with some, however, they disagree, producing headaches, etc. The experience of each individual must, as in many other things, determine this question. In advanced age I think they are generally unadvisable; or, at all events, the highest temperatures should be avoided. If doubt exists at any period of life, in relation to the question, a good medical adviser should be requested to make a general examination of the heart, nerve centers, etc., and his opinion should decide it.

The Air-bath

I have still another bath to name, which I term "The air-bath." With our usual habits of life, the skin is never uncovered or exposed to the surrounding air except for a minute or two when taking water baths; hence it becomes soft and flabby, loses its healthy surface, and more or less of its ability to resist cold, especially what is called "catching cold." It is liable, particularly in hot summer weather, to be affected by a slight, red, irritating rash, it may be a modification of what is known as "prickly heat." In order to avoid this condition, and certainly to remedy it if it occurs, I know nothing better than exposing

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the surface of the body to the air of the bedroom, with an open window, for half an hour, especially in full sunlight. Much of this period, however, may be occupied in this condition for toilet purposes, such as shaving, if this practice is followed—sad loss of time as it is, especially for men above eighty, who should economize all that remains to them—moreover, all ordinary washing and general toilet proceedings can be nearly completed, except dressing; while a walk about the room is also desirable for the purpose of meeting moving currents of air, and in this way the full half hour may be expended. After a month or two of this experience, the skin becomes firm and healthy. No rough toweling is admissible now, if the skin has been irritable, although desirable after bathing in the cold season. This is, of course, what younger men enjoy after a summer sea bath on the shore; in either case it is delightful and invigorating in every way.¹

Dispensing with the Hat

One more hint of the same kind. During the summer months it is a good habit to walk, when in the country or in the shady parts of our London parks, with the head uncovered, carrying our summer head-gear, whatever it may be, by hand. I have done this

¹ A simple and admirable recipe for itching of the skin, when no very obvious rash is visible, is made by mixing two parts of salad oil with two of genuine eau de Cologne. They do not blend, but are well shaken before use, and then well rubbed in with the palm of the hand.

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for a good many years, and for several have not had a "cold in my head," which formerly very frequently occurred. No one catches cold by exposure of the hands or the forearms to the air, simply because the skin has thus become proof against it. The practice is well illustrated by the Blue Coat School boys, who wear no caps, and are notoriously free from colds in the head. The exposure, moreover, promotes the growth and healthy condition of the hair. The practice of sitting indoors with a hat on for hours together, frequently adopted by men in clubs, is a great error.

Indoor Warmth

I have more than once incidentally referred to the presence of a fire in the bedroom. The subject of temperature within a house, throughout its various apartments, is an important one. No modern house, even of eight or ten rooms, should be constructed now without an apparatus in the basement for supplying heated air during the long English winter, or cold season, which often extends from November to March, or April inclusive—not less than six months, at all events. My experience of such supply has been gained when visiting hotels abroad in the winter, where an apparatus has existed in each bedroom by which its occupant could obtain this supply when desired. Hitherto, for the most part in this country, the necessary heat has been obtainable chiefly by employing gas

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fires in all the bedrooms where a good draught exists, or is provided for, adequate to remove the products of combustion by the chimney. These, doubtless, greatly diminish dirt, dust, and labor, necessarily occasioned by the transit of coals and removal of ashes, etc., connected with open coal fires.

Cold Bedrooms in Winter Avoided

The common habit of leaving, on a cold winter's evening, the sitting room, where a large open fire has been enjoyed by a family group seated around it to get thoroughly warmed before retiring to unwarmed bedrooms, to spend a long night in an atmosphere often twenty or twenty-five degrees under that left below, is a flagrant error; a room in which no one would spend more time than was absolutely necessary during the day. The effect of such changes of temperature, incurred by leaving the house to go abroad during the day, is provided for by active exercise and by the widely different condition of the body when it is supported every few hours by hot food and liquids, which maintain its natural temperature, besides the warmth of fires in every inhabited room.

While writing this, accidental circumstances have brought to my knowledge a new and greatly improved system of heating every part of a house, from the furnace below to the topmost floor. It possesses the following special advantages over the methods referred

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to above: 1. The air is introduced from a pure source outside the house; and, if necessary, as in a crowded city, can be deprived of the blacks and dust it contains. 2. The air is conveyed by earthenware (sanitary) tubes to every spot required. 3. The heated, and therefore dried, air is moistened, either automatically or by hand. 4. A constant circulation of the air is produced so as to introduce frequently a fresh supply. No draughts of cold air in winter can occur. The system, which is patented, has been largely applied in various parts of the country within the last ten years.¹

Hints on Self-command

I cannot close my subject without a remark or two respecting the supreme necessity, in advancing years, for firm determination to resist needless excitement from emotional causes of all kinds. If habits of self-command in respect to diet and exciting drinks have been steadily cultivated, it is probable that a due control of temper and of the passions, and the avoidance of needless sources of worry or anxiety, should come to be regarded, not only as one of the main objects of life at this period, but also as an attainable one to a great extent—the first discipline having been useful in training the will to exercise restraint and self-denial. Each period of man's personal history

¹ The patentee is Mr. John Grundy, heating engineer, City Road, London.

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brings its own appropriate duties and enjoyments. By no means the least of those which accompany old age is a satisfactory sense of the absence of desire for pursuits which there is now little inducement, or perhaps ability, to cultivate.

Hints Relative to Opinion

Again, men's opinions are apt to become more or less fixed as experience increases and habits of thought are formed. It is undesirable to assert these too strongly in the form of advice, much less to endeavor to impose them on our children, whose ways are, naturally, not as our ways. Indeed, sound and wise as our advice to young people may be, great allowance should be made for the fact that they must, will, and even ought, within certain limits, to deal in their own way with the incidents they encounter in the early stages of life's journey, and learn by their own experience—as we ourselves did—paying, however, sometimes, rather dearly for their lessons, perhaps.

An Open Mind

But it is our duty to keep our own knowledge, as far as possible, abreast of the age; especially to be interested in modern scientific discovery; in the advance of general knowledge, and in the modifications, not only respecting the varied resources of daily life,

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but in matters of thought—and even as to old and long-respected beliefs—which have to be accepted as the result. Truth comes from the future, far more than from the past. It was well and truly said by Hobbes, respecting the extreme reverence paid by mankind everywhere to ancient beliefs: “If we are to be guided by antiquity, the present age is the most ancient—that is, more ancient than any preceding, older in experience, inheriting all the wisdom of the past.”¹

And here is the privilege which the old enjoy—to sit quietly, and survey intelligently the world’s progress.

Happy are they who, having long maintained temperance in all things, preserve fair health, and attain a ripe old age, enabling them to survey the vast field of natural phenomena with growing interest, attracted by each new discovery, preserving an open mind, and ready to utilize any that conduces to man’s well-being.

Moderation in all things is the “tempo” which governs life in all the variations of the delightful theme when rightly and intelligently played.

¹ From the close of “The Leviathan.”

CHAPTER V—APPENDIX

SINCE this little book appeared in October, 1901, I have received various communications from unknown correspondents offering suggestions, criticisms, etc., to some of which I have briefly replied in writing. Among these, however, a question has been raised respecting the value of sugar in relation to diet.

A correspondent states that the opinions prevalent among society at large are extremely varied, and are habitually expressed with apparently more emphasis than intelligence. There is a large party, he states, who regard sugar as injurious in every form, and who maintain, with a fervor almost equal to that which distinguishes political controversy, its dietetic use as the cause of much evil, believing it to give rise to "gout," "rheumatism," and other evils among those who consume it habitually.

I shall, therefore, offer a few remarks respecting sugar, and a true estimate of its value as an article of diet, according to the highest authorities of the present day—premising, of course, that there are some few idiosyncrasies, as in all matters of diet, which appear to be exceptional, but that the facts and prin-

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ciples adduced here are correct and applicable to people generally.

I shall commence by remarking that the use of sugar as food has enormously increased in quantity during the last few years. Compared with the present price, it was a very costly article at the commencement of the nineteenth century, and was very little used by the poor, being a luxury almost beyond their reach. At the present time it is one of the cheapest forms of food, and its use has become almost universal, the actual amount now consumed annually by the population of Great Britain being no less than eighty pounds per head.

Speaking technically, there are two forms of sugar used for diet: the first are the "sucroses," furnished by cane sugar, beet-root sugar, milk sugar, besides one or two others; the second, the "glucoses," or grape sugar, the sugar in other sweet plants and fruits and honey.

Cane sugar in its raw form is too well known to need description. When refined it forms what is known as loaf sugar, which is, perhaps, the most perfect form of that agreeable carbohydrate. A much larger proportion of this is furnished by the juice of the beet root than by that of the cane. Milk sugar, or lactose, has no sweetening property, but being the carbohydrates of milk, is very desirable as a form of nourishing food for dyspeptic patients requiring to be limited to a "milk diet," because they are unable to consume any cane sugar without setting up fermenta-

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tion and suffering great discomfort; nor indeed can they take any other food with such good result as that named, for a certain period of time.

All cane and beet-root sugars are rendered digestible, in health, by a process they undergo in the stomach and allied organs, in which they are converted into "glucose"; the same form as that which we have already seen exists in grapes and other ripe sweet fruits. Most persons with ordinary digestion can take sugar with advantage, provided they take it in moderate quantity and well diluted, say two or three large lumps in a breakfast cup of tea.

Those who have a strong tendency to obesity will generally be wise in dispensing with both sugar and milk in any but moderate quantities.

It is scarcely sufficiently known that sugar is a very valuable food where much muscular exercise is taken and much bodily labor performed. Especially in adults who are becoming exhausted with labor, sugar may be taken largely, with the effect of rapidly affording a fresh supply of power. On the other hand, it agrees well with children, and is one of the best and most palatable sources of food for them, taken under the rules above given, chiefly relating to its moderate dilution.

It thus may be inferred that healthy persons, not suffering from indigestion or obesity, may generally use sugar in a moderate quantity with advantage.¹

¹ *Vide* "Food and Dietetics," by Dr. Robert Hutchison, third edition, pp. 260-73.

Part IV

PRACTICAL KITCHEN SCIENCE

BY

JANET McKENZIE HILL

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CHAPTER I

Elementary Processes of Cooking

Roasting or Baking of Meat or Fish. (Suitable for tender meat.)	{	Broiling.	{	Over Coals.
		Sautéeing.		Pan Broiling.
		Frying.		
Boiling. (Suitable for either tender or tough meat.)	{	Stewing.	{	
		Braising.		

Roasting and Baking

ROASTING and boiling are the most primitive ways in which heat is applied in cooking; other methods are derived from these. Of these, roasting and its derivatives are the most esteemed. This is on account of the appetizing flavors, analogous to that of caramel, which are brought out by the high temperature to which the article is subjected. In roasting, flesh is exposed to the direct rays of an open fire, but similar results can be obtained by heat reflected from the hot sides of a well-ventilated oven. As the latter method is the one in common use in this country, the words roasting and baking are herein used as synonymous. As roasted and

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broiled meats, save poultry, are usually served at least a little underdone, this method of cooking is admissible only for tender meats, time being a necessary factor when tough connective tissues are to be made soluble.

First wipe the outside of the joint, or the inside of poultry, with a damp cloth; then set on the rack in a dripping pan of ample size. Have the rack smaller than the pan that the drippings for basting the joint may be gotten at easily. Let the pan stand in a very hot oven (a little hotter than for bread) about fifteen minutes to sear over the outside and imprison the nutritious juices, then close the draughts, move the pan to a cooler part of the oven, and, if necessary to avoid burning, add a little hot water to the fat that has already dripped from the joint. To keep the meat from drying, spread over it every ten or fifteen minutes—the smaller the joint or article the oftener—the fat in the pan. Poultry and game, deficient in fat, must have this supplied in some form. A small roast may be seared over in a frying pan; if this be done, less heat is required in the oven.

Broiling

In broiling or grilling, as in roasting proper, the article to be cooked is exposed to the direct rays of the fire, but in broiling we are dealing with thin pieces of meat, or viands, dressed to present as much

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surface as possible to the heat; when properly cooked, the outside is slightly crusted over, while the inside is but delicately cooked. To secure this result the article is set about three inches from the coals, or fuel, at first, and is turned every ten seconds. The strong heat hardens the albumen in the ends of the hollow fibers and confines the juices; by frequent turning burning is avoided, and both sides are cooked evenly. After the surface of the meat is well seared over, it should be withdrawn to a greater distance from the fire to finish the cooking. A hinged broiler, which does away with handling the article in turning, is the desirable utensil. Before using, heat this gently and oil well the bars with fat from the meat.

In broiling, gas and electricity give fairly good results, but broiling by electricity more nearly resembles pan broiling, to be noted later. Gas is better adapted to broiling fish than steaks and chops. When a clear bed of coals is not at hand, a broiler, in which charcoal is the fuel, may be used with almost any stove, provided the stove be connected with the chimney. In broiling by any fuel, let the dampers be turned to carry the flame, caused by the dripping fat, away from the meat up the flue. As long as the meat contains uncoagulated juice, it will have a puffy appearance and rebound under pressure. One experienced in broiling can judge quite accurately of the condition of the meat by appearance and sense of touch; others will do well to regulate the time of cooking by the clock. Birds,

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sweetbreads, and other delicacies are often wrapped in oiled paper before broiling.

Pan Broiling

Rub over the surface of a very hot cast-iron frying pan with a bit of fat; put in the meat, and turn constantly, keeping the pan very hot. A cast-iron pan holds heat longer than a sheet-iron pan. Pour off melted fat that collects in the pan lest the meat be *sautéd* rather than broiled.

Sautéing

It is but a step from pan broiling to *sautéing*; let the fat remain upon the chops and melt into the pan, and in this cook the chops, first on one side and then on the other, and, in reality, they are *sautéd*. In practice, the fat to be used needs to be made hot in the pan, and then the article to be cooked is browned in the fat, first upon one side and then on the other. After the first side is cooked and the article is turned over, to cook the other side, the first side, being exposed to the air, cools very quickly, and the condensing steam leaves a vacuum into which the fat upon the outside settles, there being no opportunity to drain it off. Fat raised to a high temperature undergoes changes by which fatty acids are evolved, and these are not wholesome, so this form of cooking is not to

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be commended. When indulged in, the article to be cooked should be dried by rolling in flour, meal, or fine crumbs; then have the fat smoking hot, to sear over the outside and keep in the juices.

Frying

Frying is a method of cooking in which heat is communicated to the article to be cooked by immersion in smoking-hot fat, that is, in fat at a temperature between 345° and 400° F. Two important things are to be noted in frying: the article to be cooked is to be immersed in the fat, and the fat is to be smoking hot; also, the preparation of the articles themselves should receive attention. In order that the articles to be fried may be immersed, use a deep kettle (a round, iron, Scotch bowl is needed); this must be filled with fat to nearly two-thirds its height, vegetable oil, cottonseed oil, lard, clarified drippings, or with a mixture of these, according to one's means or taste.

Smoking-Hot Fat

Cooking fats do not boil; the bubbles rising in a kettle of hot fat and the spluttering noises are caused by water in the fat. If the temperature of spluttering fat be tested, the thermometer would register about 212° F., and as long as any water remains in the fat the temperature cannot be raised above this point;

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but when the water has evaporated the fat becomes still, and in a short time a faint blue smoke, or, more properly, vapor, becomes visible. This indicates a temperature of about 380° , and is the proper temperature for frying small articles; those, for instance, that are protected by a covering of egg and bread crumbs, especially if they have been previously cooked, as *croquettes*. Potatoes sliced thin, or tiny whitebait—the one on account of being cold and containing a large quantity of moisture, the other on account of size, and both because they are to be thoroughly crisped—require fat at a higher temperature, that is, about 400° , while doughnuts and fritters are cooked at a temperature of about 345° . Vegetable oils reach the proper temperature for frying before smoke is visible, and, in any case, if one fails to detect smoke, the temperature may be tested by throwing in a piece of bread.

Tests for Hot Fat

If the fat bubbles vigorously around the crumb, throwing out large bubbles of steam, and the bread browns while one is counting forty or fifty, the smoking point has been reached. If only small bubbles appear around the crumb and it does not brown quickly, the cooking point has not been reached. As articles that are to be cooked in fat contain water, which will be turned, in the hot fat, into steam and cause a “spluttering,” it is well to make the surface of these

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dry before they are lowered into the fat. Sometimes flour, or flour mixed with liquid to form a batter, is used for this purpose, but egg and bread crumbs are used more frequently. When the article inclosed in a coating of egg and crumbs is plunged into the hot fat, the albumen in the egg coagulates at once, forming a fat-proof covering about the article. There is always some moisture, even in dry crumbs, as well as in the object itself; this keeps down the temperature inside the coating; also the coating not only keeps out the fat, but keeps in the flavor and savor in a remarkable manner, and the result is, if the article be but removed from the fat at the proper time, a most juicy and delicious plat.

Utensils for Frying

A deep iron bowl with a bail, known as a Scotch bowl; a wire basket that fits loosely into the bowl; a long-handled fork or spoon to hold the basket during frying and while the cooked articles are draining; a tin pan to set the basket on, and soft paper in a second pan for the final draining, are the utensils that render frying a simple process. When a frying basket is not accessible, a long-handled skimmer will do fairly well.

Time of Cooking

The articles should not be crowded in the basket, or they will lower the temperature too much; nor

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should they touch each other. The color when cooked should be fresh, bright yellow or delicate brown. Fat in which chops or fillets of fish are to be cooked (these require about five minutes' cooking) should be drawn to a cooler part of the range after the first minute of cooking, lest the articles become too brown before they are thoroughly cooked. As the fat is not, or should not be, as hot when the frying is completed as at the beginning, it should be reheated until the smoke rises before a second lot is fried. Do not let the articles touch each other while draining on the paper at the mouth of the oven, else they lose their crispness; remove from the basket and also arrange on the serving dish with the tips of the fingers.

Care of Fat

When the frying is completed and the fat has stood a few moments, to cool and settle, strain through a sieve—an old one will do, over which a piece of cheesecloth has been spread—into a clean receptacle; wipe out the bowl with cloth or papers and return the fat; cover and set aside. When needed again, let stand on the back of the range and heat very slowly, then drop in some thin slices of potato; potato being very porous will absorb the impurities from the fat and thus clarify it. Particles of flour, etc., left in the fat after cooking will, when the fat is reheated, turn to charcoal, or become carbonized and cause the fat to become

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dark in color; for this reason, or because the fat has been overheated and undergone chemical changes, fat that has been used only a few times often becomes unfit for frying, as it will not brown the food properly. When this is the case, set it aside for soap making; with proper care, however, fat may be used for frying many times.

Olive oil does not burn as readily as animal fats, and for this reason it may be used more repeatedly than lard or drippings. But in careless hands any fat is liable to become overheated and burned. The same kettle of fat may be used for frying all articles, if the fish or anything that imparts flavor be carefully protected with egg and bread crumbs; but, in practice, where much frying is done, it is more economical to keep two bowls, one for fritters and flour mixtures, the other for fish and meat preparations, renewing the fat in the latter from the former and adding fresh fat to the first kettle as it is needed. The fat from mutton, turkeys, and smoked meats is not good for the fat "bath"; bacon fat is used for *sautéing*. When properly conducted, frying in deep fat has been found by careful experiments to be more economical than *sautéing*; it is also more wholesome, as articles thus cooked properly and drained absorb very little fat.

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Boiling

Boiling as applied to cooking is the application of heat to food products through the medium of boiling, or simmering water. At sea level water boils at 212° F., and simmers at 185° . Rapid-boiling water, unless the steam be confined, attains no higher temperature and so cooks food no more quickly than water boiling less rapidly. When rapid-boiling water is advisable, as in boiling macaroni, rice, or peas, the object is not to cook more quickly, but to separate the contents by violence of motion and keep them from clinging to the receptacle in which they are cooked. The boiling point of stock and milk is slightly higher than that of water. Milk boils at 214° ; as this temperature hardens the casein, thus making it less digestible, milk should not be allowed to reach the boiling point; it should be cooked over hot water. When beadlike bubbles appear on the edge of milk next to the dish the milk is scalded. Scalded milk reaches a temperature of 196° . As we wish to retain all the juices in boiled meat, we plunge it, first of all, into boiling water, and after searing over the outside reduce the temperature to the simmering point. Water does not simmer when it is perfectly still; the surface of the liquid should stir gently. When bubbles are formed that break upon the surface, the water boils. While rapid boiling softens the connecting tissues between the little bundles of fibers and causes meat to *appear* tender,

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the fiber itself is made soluble only by long, slow cooking; also the flavors of meats (and vegetables as well) are volatile, and much of these is carried off in the steam from rapidly boiling water. Thus, it would seem that, save for the hardening of the albumen, reason suffices for cooking meat, after the juices are imprisoned, at the simmering point. Closed vessels aid in retaining flavor.

Stewing

Stewing is done by gentle simmering in a small quantity of liquid; by this means the juices and gelatinous substances in the products are partially softened and dissolved in the liquid; the savor and juices of the contents are divided between the article thus cooked and the liquid. Chef Meyer notices three varieties of stews: the brown stew, known as the ragout, or haricot; the white stew, as *blanquette*, or fricassee, and miscellaneous, or mixed stews, as the Irish stews and Hungarian goulash. The color of the brown stew is secured by browning, or *sautéing*, the meat before the water is added. The meat for a white stew is put over a fire with cold water to cover, and the cooking proceeds very slowly until the boiling point is reached; when this has been well established, the cooking is completed at the simmering point. When the meat is tender, the vegetables used for flavoring are removed, and the sauce is thickened with a *roux*, or with flour mixed smoothly with water to pour. Oftentimes stews are

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thickened by the addition of barley, rice, oatmeal, and potatoes, and a garnish of vegetables, as small boiled onions, green peas, potato balls or slices, or mushrooms are added. A close-covered saucepan, or a fire-proof casserole, are the best utensils for making stews. The cooking may be done in the oven or on the top of the range.

Braising

Braising is a more elaborate process of stewing. This form of cooking is suited to small pieces of meat; it provides a dish of rather more pretension than a stew, and yet one that, while it may supply the place of a roast, would not be considered quite as elegant. Pans are made for braising, with lid sunk so as to hold hot coals, or burning charcoal, and thus providing heat above and below. Such pans are expensive; an ordinary pan, or plain earthen casserole with a cover, answers every purpose. The article to be braised should not be very much smaller than the dish itself; a two-inch space on all sides of the article is ample.

Melt in the dish an ounce of butter, or drippings, and then put in a layer of mixed vegetables—carrot, onion, celery, turnip, etc.—cleaned and cut into small cubes; add also a piece of bay leaf, a sprig of parsley, and a sprig of thyme, if at hand. On this bed lay the articles to be braised, trimmed and fastened in compact shape; also larded, if desired. Put the cover over the meat and let cook, shaking occasionally for about

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fifteen minutes; then add water, or stock, to touch the bottom of the meat. Spread a layer of vegetables over the top of the meat and cut a piece of white paper a little larger than the top of the pan; brush this over with oil, butter, or dripping, and lay closely down over the meat and vegetables, so as to keep in all the steam. Put the cover in place and let simmer very gently until done; then remove the cover and paper, and brown the top of the meat in a hot oven. The time of cooking varies with the kind and quality of the meat.

CHAPTER II

Eggs

It was our own Emerson who said: "There is a best way of doing everything, even if it be to boil an egg." And yet with eggs the best way is not "to boil" at all, but to cook at a temperature below the boiling point of water, or, to be exact, not above 180° F. An egg possesses its highest nutritive value in a raw state, and the higher the temperature to which it is subjected and the longer it is exposed to heat the more indigestible the albumen becomes. The white of an egg is nearly pure albumen; the yolk, though rich in albumen, contains about thirty per cent of fat, and is also rich in sulphur. There are no uric-acid derivatives in eggs.

No other than fresh-laid eggs can be served at the breakfast table with full satisfaction. As the quality of the yolk, on account of its composition, is soon impaired, it should not be retained in the stomach longer than the time of normal digestion. If the egg, when eaten, be no longer fresh, or if, for any other cause, its digestion be impeded, derangement of the stomach and intestines is liable to follow.

Eggs are digested more readily when the whites

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and yolks have been mixed thoroughly before cooking, as in scrambled eggs and omelettes; for, in this case, the white is not taken into the stomach in a separate hard mass.

Bilious people are accustomed to discard eggs in any form; but doubtless such may eat the whites of fresh eggs, especially when they are served in the form of a delicately baked custard, since, in this case, the white, which is used alone, is broken up by beating and then is diluted by the other ingredients. It is the richness of the yolks that occasions disturbance; thirty parts of yolk in one hundred are fat, or oil, while the white contains but two parts of fat in one hundred.

An egg is probably at its best when about twelve hours old. The shell of a fresh egg is full, but as the egg grows older the water in composition evaporates through the porous shell, leaving a space, and the air penetrating causes the contents to deteriorate. When first laid the yolk is surrounded by the white, but evaporation leaves it nearer the shell, and, if the egg be not left with the small end downward, the yolk from its weight will soon touch the shell, and contact with the air quickly spoils it.

How to Tell Fresh Eggs

A fresh egg feels heavy and sinks in water; the dark spot that represents the yolk should be in the center of the mass. No audible sound is made when a

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fresh egg is shaken; shake one less fresh, and the beating against the shell is perceptible.

How to Preserve Eggs

To preserve eggs for any length of time, exclude the air by covering them with fat, wax, strong brine, or limewater; or pack them in sawdust or meal.

Eggs may be kept fresh in a cool, dry place for months by packing them, small ends down, in a bed of ordinary coarse salt. The shells should not come in contact, and each egg should stand upright. The salt holds the egg firm in position and excludes the air. Fine coarse-salt, such as is often used in freezing, is adapted to this purpose.

To Preserve Eggs for Use in Winter. (Mrs. Kimball, Stockbridge)

Into each three gallons of water mix one pint of fresh-slacked lime and one-half pint of common salt; put in the eggs and cover with a board sprinkled with lime and salt.

To Keep Whites and Yolks as "Left Over"

In recipes where only yolks are called for, the whites may be kept, if carefully covered, in a cool place, for some days. When yolks are left over they cannot

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be kept as long as the whites. The yolks should be beaten in a bowl or cup and carefully covered with a saucer. When they are required, they will be found in much better condition than when they are set away without beating (covered with cold water). When a recipe calls for whites of eggs, and one is to have no immediate use for yolks, drop the yolks very carefully, as the shells are broken, into hot water, "just off the boil," and, after they are cooked throughout, set aside to serve in soup, one in each plate. Or, the cooked yolks may be rubbed through a sieve as a garnish for a salad, or for the top of a dish of cream toast, or meat warmed in a sauce.

CHAPTER III

Fish and Shellfish

Fish with Scales.

Shellfish.	{ Bivalves.	{ Oysters. Clams. Scallops.
	{ Crustaceans.	{ Lobsters. Crabs. Shrimps.

FISH contains all the elements of meat in an easily digested form; on this account it is adapted to the needs of old and young alike, and especially to sedentary people. In primitive times, when each man supplied his own larder at first hand, fish-abounding streams were chosen for the abodes of men. As people grew in culture and refinement their written history, both sacred and profane, contains frequent allusions to the capture, cooking, and eating of fish.

It is said that the Emperor Charles V visited the grave of the man who systematically introduced into the Netherlands the preservation of herring by salting, smoking, and drying them, as a benefactor of mankind. Lucullus, at great expense, connected a lake near

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Naples with the sea, in which he might keep sea fish alive. We catch a glimpse of the life of the age in the passage of sacred history where Simon Peter says, "I go a-fishing," and we marvel at the great draught of fishes after the long night of discouragement. What reader does not experience a thrill of the satisfaction that must have been felt by those weary men, on landing, at sight of the "fire of coals and fish laid thereon and bread."

On account of abundance, many varieties of fish are inexpensive. The price even of the choicest species, barring mollusks and crustaceans, in season, is not high, when it is compared with the cost of the best cuts of meat.

Though fish has been a staple in food since the earliest times, yet the serving of fish in such form that it can be eaten with pleasure by people of delicate and æsthetic tendencies is of more recent date. This only affords additional proof that the cultivation of a people is determined by the manner in which they cook and serve their meals.

Notwithstanding all the shippers tell us of the conveniences of transportation, and of flavor preserved by keeping fish packed in ice for some days, we are inclined to be skeptical, and fear that housekeepers who dwell far inland will not find in their markets sea food in prime condition. In the vicinity of the Great Lakes, however, excellent whitefish and lake trout make up, in part, for this deficiency. Brook trout, than which few

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fish are more highly prized, are plentiful in many a mountain stream, and fresh-water lakes are destined to be stocked with the black bass and other edible fishes. Indeed, since cultivated trout can be sold at a profit, and the supply is said never to equal the demand, there would seem to be an opportunity here for a paying business venture.

Of salt-water fish, cod, haddock, and halibut are the staples. Common mackerel appear about the first of April, the Spanish about the fifteenth of the same month. Spanish mackerel is sold at twenty-five cents per pound, the common at so much a fish—the price depending upon the season and size of the fish. Both are very handsome. They are easily distinguished by their color and marking. Indeed, from its marking the fish takes its name, this being derived from the Latin word *macula*, meaning a spot. The common mackerel is usually smaller in size than the Spanish, and the dark blue above is covered with many wavy, blackish cross streaks. The Spanish mackerel is bluish and silvery above, with bright reflections, and upon the sides are many roundish bronze spots.

The huge swordfish, from which firm slices may be cut, is in season from July to September. Bluefish abound in May, when deep-sea fishing becomes possible. Frozen salmon may be found, in the Eastern markets, during the winter and spring, but the season begins in June. Salted salmon is especially deserving of mention, for even after the salting and freshening

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processes have been completed the fish is very rich, both in nitrogenous elements and in fat; it is good either boiled or broiled.

Salt codfish may be so cooked as to make a most palatable and wholesome breakfast or luncheon dish. It is comparatively easy of digestion, and is said to be particularly good for children troubled with complaints incident to hot weather. It also acts as a sedative in cases of dyspepsia caused by fermentation.

Shad are taken at Charleston in January, at Norfolk in February, at New York near the last of March or the first of April, and at Boston by the end of April. The fish come from the South, running up the rivers from the sea to deposit their spawn in fresh water.

The season for brook trout begins April 1st. They come just in time to take the place of smelts, which are then no longer seasonable. The fishery of whitebait begins in April. This delicacy in fish, served at the popular clubs, is made fashionable on account of the ministerial whitebait dinner given at Greenwich just before the prorogation of Parliament. The labor involved in preparing and cooking this tiny fish is a drawback against its large consumption.

To Determine the Freshness of Fish

Of fresh fish there is no odor; the flesh is firm, bright, and crisp-looking; the eyes are bright, not dull and lusterless, and the gills are of a bright-red color.

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Preparation of Fish for Cookery

TO CLEAN FISH

Fish, either salt or fresh, is the better if it be cleaned and drawn immediately on being taken from the water. This is emphatically true in the case of fresh-water fish. Fish cleaned at the market will need additional attention. Begin at the tail and scrape the fish to remove scales. See that the flesh be clean close to the backbone. Wash quickly, inside and out—but do not let the fish stand in the water—drain and dry.

Let stand, skin side down, upon the ice until time of cooking. This, according to Izaak Walton, should be speedy. Mackerel and bluefish, in particular, after transportation, even on ice, scarcely resemble the same fish when it is eaten within a few hours after it has been taken from the salt water.

SERVING FISH

If the fish is to be served whole, leave head and tail intact, but remove the eyes and cut off the fins. In whatever way the fish be cooked, it should be carefully drained and mounted; use parsley or cress most lavishly in its garnishing.

TO REMOVE THE SKIN

It is a very simple matter to remove the bones, also the skin, from some kinds of fish, thus leaving the flesh clear and intact. Cut off the fins along the back, and

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then a strip of skin less than half an inch wide down the full length of the back; also cut the skin around the head. Dip the fingers in salt that they may not slip, then, after loosening the skin below the head, draw it off from one side of the fish, by pulling gently with one hand and pushing with the back of a knife held in the other hand, so as to keep the flesh whole; repeat the process on the other side of the fish.

TO BONE A FISH

Beginning at the tail, on one side, slip the knife in between the flesh and the bone and cleave the flesh from the bone its entire length; this gives one fillet; remove the other in the same manner. These fillets may be cooked whole, or cut in such pieces as are desired. Halibut cut in transverse slices, half an inch thick, is filleted by removing the skin on the edge and the single piece of bone from the center. Each slice thus gives four fillets. Fillets of halibut and flounders are often sold as "fillets of sole." The sole is not found in our waters. The inexpensive flounder, dear to memory through the fairy tales of Grimm, will be found, when filleted and served with tomato or other piquant sauce, a most appetizing tidbit; but it is not quite the equal of the English sole. The more expensive chicken halibut is considered by many superior to sole. Large fillets from cod or haddock may be baked on an oiled fish-sheet, with an oyster or bread stuffing between and buttered crumbs above. If small, they may be mari-

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nated, rolled, and fastened in shape with a small skewer or wooden toothpick. Butter the skewers that they may be easily withdrawn after the fish is cooked. These fillets may be braised, baked, or, after egging and breadcrumbing, fried.

Frozen fish need to be thawed out in cold water, then cooked at once.

General Ways of Cooking Fish

Fish may be boiled, braised, baked, broiled, or fried, according to individual fancy, but a certain way is more suitable for some varieties than it is for another. Red-blooded fish, as salmon, bluefish, and mackerel, in which the fat is distributed throughout the fish, being rich and moist, should be cooked by other methods than *saut  ing* and frying. Any white-blooded fish, as cod, haddock, and halibut, in which the fat is concentrated in the liver, will bear cooking by these latter methods.

Salmon, which possesses a higher nutritive value than meat, chiefly on account of the large proportion of fat in composition, may be cooked in boiling water, which, as a general rule, unless the water be used as stock, is a wasteful way of cooking fish. When the white varieties are cooked in water they need to be supplemented by rich sauces; and when baked they must be basted often, or they will be dry and tasteless. All fish, like veal and pork, must be thoroughly cooked, lest they be worse than unpalatable; that is, positively

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inimical to health. If cooked too long, however, fish loses flavor and is "woolly."

Oysters

Shellfish, like fish unprotected by shells, are classed as white- or red-fleshed. When fresh, white-fleshed shellfish, of which oysters are the principal variety, are comparatively easy of digestion, while the red-fleshed lobsters and shrimps are even more difficult of digestion than are salmon and bluefish.

Oysters are in season from September to May. They are sold in the shell by the dozen or peck, or, after removal from the shell, by the quart. There are about fifty oysters in a quart. The freshness of an oyster is of first consideration, and, when possible, it is well to buy them in the shells. For transportation in bulk, after removal from the shell, preservatives are used. On this account the value of oysters, as usually purchased, for the use of those convalescent after sickness, is doubtful.

The two valves of the oyster's shell are somewhat dissimilar; the left, or lower valve, is deeper and more capacious; this is the half of the shell from which raw oysters are served; by a calcareous growth from this valve the oyster is attached to foreign bodies. The two halves are held together by an adductor muscle, each end of which rests in a slight depression in the valve. This muscle is the white, button-shaped part of

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the oyster; it is tough and indigestible, as are also the edges or gills of the oyster, and both are often removed before cooking. When so treated the oyster is said to be bearded.

Oysters are found in all seas at a short distance from shore. The favorite habitat is the tranquil waters of a bay formed by the mouth of a large river. Oysters from Chesapeake Bay are most esteemed in this country. Those taken from the coast of New Jersey and Long Island Sound are also in favor.

In the New York markets the small Blue Points, taken from the southern shores of Long Island, are in demand for service on the half shell. In the Boston markets, Providence River and Cape Cod oysters are quite generally used. At the present day we have very few natural oysters; nearly all are the result of cultivation—the resulting stock, it is said, being superior to the natural oyster.

Oysters are not very nutritious; they are eaten more as a “provocative to appetite” than for their food value.

To Open Oysters

Push a thin, flat knife under the right or upper valve of the oyster, and cut the adductor muscle. Then the right valve may be lifted up and separated from the lower valve that contains the oyster. Put the oysters into a collander over a bowl; pour over each quart a generous half-cup of water; inspect the oysters, one by

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one, to see that no bit of shell still adheres. Save the liquor to use with the oysters, or in making fish stock or sauce. Pour off the liquor carefully, as sand is liable to be found at the bottom.

Clams

Clams are dug with a rake, when the tide is out, in the gravelly mud of river mouths, the beds being exposed at low water. They are found about a foot below the surface. When cooked, the harder part of the clam is quite indigestible. When this part is used in cookery it needs to be chopped, or, better still, discarded entirely, after it has yielded its juices to a dish. The variety known as Little Neck clams is served raw in place of oysters, when these are out of season and clams can be procured.

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A SIDE OF BEEF

Divisions		Ways of Cooking
Hind Quarter.	1-2. Flank (thick and boneless).	{ Stuffed, rolled and braised, stewed or boiled. Beef stew or braised. Steaks, best cuts for beef tea. Hamburg steak, cannelon of beef. Hamburg steak, cannelon of beef. Roasts, hip or flat-bone steaks. Also for braising or stews. Roasts or short steaks. Sirloin and porterhouse steaks. Steaks and roasts. Larded and roasted or broiled. Cheap stew or soup stock. Good roast. Small steaks, in best beef and stews. Hamburg steaks. Beef tea. Mince meat. Hamburg steak. Corned for boiling. Corned for boiling. Corned for boiling. Finest pieces for cornings. Inferior pieces for soup stock and stews.
	3. { Aitch Bone. Top.	
	4. { Round.	
	5. { Lower Part.	
	6. { Vein.	
	7. Rump.	
	8. { Tip.	
	9. { Middle.	
	10. { First Cut.	
	11. { Is sometimes sold as a fillet.	
Fore Quarter.	12. Hind Shin (best marrow).	
	13. Five Prime Ribs.	
	14. Five Chuck Ribs.	
	15. Neck.	
	16. Sticking Piece.	
	17. { Thick End.	
	18. { Second Cut.	
	19. { Thin End.	
	20. { Navel End.	
	21. { Butt End or	
	22. { Fancy Brisket.	
	23. Fore Shin.	

CHAPTER IV

Beef, Poultry and Game

Tongue, fresh or corned	Boiled, Braised.
Heart	Stuffed and Braised.
Liver	Boiled or Fried.
Kidneys.....	Stewed (Ragout).
Tail.....	Soup, Braised.
Tripe	Broiled, fried in batter, etc.

BEEF dressed for the market is divided at the backbone into two parts, each of which is termed a side of beef. The weight of a side is from three to five hundred pounds. Of this much less than one hundred pounds is tender meat, suitable for quick cooking, as roasted or broiled meat. But while meat thus cooked is better relished, and oftentimes better adapted to our physical condition, it is less nutritious than those parts that are nourished by muscular use and which, in consequence, secrete juice and flavor. For these cuts long, slow cooking, with moisture, is needed to soften the collagen, so that the little bundles of fibers may fall apart easily when they come in contact with the teeth.

The lean in beef of good quality is of a dark-purple color when first cut, but soon it turns to bright red. It should be coated and, especially the tenderer cuts,

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well mottled with fat. The fat in beef of prime quality is firm, of a light-yellowish color, and crumbles easily. What is fat in a good quality of meat is water in a less desirable article. The neck and fore quarter of an ox or sheep contain more nutritive value than the juiceless tenderloin and other more tender and more expensive cuts. Broth from the neck of mutton has more flavor than that made of a cut from the ribs. So, also, in making chicken broth the first choice would be the legs and wings of the fowl.

In all markets a side of beef is divided into hind and fore quarter, but the point of this division, as also for other smaller divisions, varies in different sections of the country, and at different markets in the same section. In New York City markets the division into hind and fore quarter is so made that the thirteen ribs are included in the fore quarter. In Boston markets three ribs are included in the hind quarter. In a few Boston markets the rump, separated from the loin, is cut into roasts and stews, the upper part, or back of the rump, giving a large and choice roast. This custom is not general and is usually frowned upon by marketmen who cater to family trade. When meat comes from the market, remove it at once from the paper in which it is wrapped, wipe the outside with a damp cloth—do not wash—cut off any unsightly bits, and set aside in a cool place—but not directly upon the ice—until the time for cooking.

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Poultry and Game

The term poultry includes all domestic birds used as food. Game is a term applied to wild animals taken in hunting, trapping, fowling, and fishing. Pigeon and squab are included under game. In some localities game is lower in price than beef or mutton. Game is rich in phosphates and, on account of the natural manner in which wild creatures feed and live, and also from absence of fat, it is more readily digested than most nitrogenous foods. When hung a proper length of time, the flesh of most game is tender (wild geese and ducks excepted). The custom of allowing game to hang to induce "high" flavor is a menace to the health of the consumer and should be discouraged, particularly in case of game of dark color, which is usually served quite rare. The best cuts of venison correspond to the best cuts of beef or mutton and are cooked in the same manner. Spring chickens hatched in incubators may be had for broiling at almost any season of the year, but from January to July the price is too high to admit of purchase save on rare occasions. From July to September the price is such that they may be considered among the possibilities for a Sunday dinner, or a "little dinner" when guests are in attendance. Young turkeys in August and September are delicacies purchasable by the few. All fowl are in their prime from November to March. When admissible, all birds should be dry-picked and "drawn" as soon as

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killed. This last precaution insures a wholesome and well-flavored viand. Pinfeathers indicate a young fowl; hairs an older one. If the end of the breastbone be cartilaginous, bending easily, the fowl is not more than a year old; after that age the cartilage hardens into bone. The legs and feet of a young fowl are soft and smooth to the touch; upon the legs of older fowl the scales are sharp and pronounced, and the spurs are strong and large.

How to Clean and Draw Fowl

Many poulterers singe and draw fowl; they also remove the tendons from the drumsticks, whereby that joint is very much improved. The dealer has all the conveniences for this work, and if he attend to these matters the time and strength of the housekeeper are saved. At the same time he will need looking after; the lungs and bean-shaped kidneys lie in small cavities, and only the careful, painstaking marketman takes trouble to remove them.

If this work be done at home, the first thing, the fowl having been picked, is to remove pinfeathers and all feather stumps remaining in the skin; a strawberry huller is the best thing yet devised for this purpose. Singeing is next in order. One or two tablespoonfuls of alcohol ignited on a tin dish affords the best means for doing this; lighted paper may also be used. Take the bird by the head and feet and turn it constantly

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that the flame may touch every part. To singe small birds run four or five at a time a little distance apart on a long skewer, then taking the skewer by the ends pass them over the flame, turning the skewer meanwhile.

Cut off the head—the heads of canvasback and other choice varieties of wild duck and those of small birds are often left on the body—and after loosening the crop by passing the finger around the same, draw out the gullet with crop attached and the windpipe; if the crop be not very full—as it should not be—this may be done without making a slit in the skin of the neck. When necessary to cut the skin, it should be done at the back. Cut off the neckbone even with the top of the breast, but do not cut off the skin. When the fowl is trussed, the skin may be brought down under the tips of the wings and fastened either with a skewer or the thread that is used in trussing.

Cut carefully just through the skin of the leg at the joint, or make a cut lengthwise through the skin below the joint; at either place the tendons running up into the drumstick will be exposed, and with a trussing needle or skewer they may be drawn out one after another. At the market the poulterer, after slitting the skin to lay the tendons bare, hangs the fowl, first by the tendons in one leg and then by those in the other, upon a meat hook, and with a single pull the tendons are drawn. The Little Giant tendon puller has been devised lately; by its use all the tendons in one leg of

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a fowl may be drawn at once. When one sees how easily these are removed, it seems strange that this really marked improvement in the dressing of turkeys is so universally omitted. Cut a small opening just through the skin under the rump, near the vent, insert at first one and afterwards two fingers and pass them around close to the body, between the body and internal organs, at first close to the breastbone; then reach in beyond the liver and heart and loosen on either side down close to the back. After all the internal organs are loosened take hold of the gizzard, which lies at the base of the breastbone, and draw this out gently, and all that has been loosened will follow. In drawing a fowl avoid breaking the gall bladder attached to the liver, the liquid from which will cause a bitter taste in whatever it comes in contact with. The lungs, lying in cavities under the breast, and the kidneys in cavities in the backbone, need to be taken out separately.

Wipe out, or rinse if needed, and dry thoroughly. All birds to be served whole are cleaned and drawn after this manner.

Dressing Fowl for Broiling

When birds are to be broiled, they are cleaned and the tendons are drawn in the same manner, but they are drawn in a different way. Lay the bird upon the meat board, breast down, and with a sharp strong knife cut down through the flesh on each side of the back-

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bone, from the neck to the rump, thus cutting out the rump, the backbone, and the neck; lift up the backbone slightly and with the fingers loosen the internal organs from the back, first on one side and then on the other, then loosen them from the breast; after this has been done, the neck, backbone, and rump, with all the internal organs attached, may be separated in one mass from the rest of the bird; now carefully scrape and push the flesh from the breastbone and remove that; remove the rib bones; cut off the legs at the second joint, and cut through the sinews at other joints.

Dressing a Fowl for a Fricassee

Singe, remove pinfeathers and tendons, then separate the fowl into pieces at the joints. Beginning with the legs, cut through the loose skin between the legs and the body, bend the leg and cut off at the joint; by moving the legs a little, the joint between the "second joint" and drumstick can be ascertained; cut through the flesh at this place, then sever the ligaments. Cut through the skin and flesh on the under side where the wing joins the body, and disjoint the wing. Make an incision between the ends of the breastbone and the tail, near the latter; carefully cut through the skin from the incision to the backbone on each side. Then remove all internal organs. Cut through the ribs, and the articulation at the top of the collar bone, thus separating the breast and back; divide the back by cutting

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through the middle crosswise. Often the wishbone and flesh attached to it are cut off and the rest of the breast chopped into two parts at the bone; these, however, are not natural divisions, but convenient for serving. Wipe the pieces with a damp cloth and wash the inside of those that need it; do not soak in water. A fowl for broiling or for friscassee needs to be fresher than for roasting. If a fowl have an odor about it that indicates long keeping, wash on the inside with water in which a little soda has been dissolved and let stand until time of cooking with bits of charcoal inside. Chickens and turkeys one year old are best for roasting. When older, steam for an hour or more, then finish cooking, and brown in the oven.

CHAPTER V

Soups

It is written that the *chefs* of France in the time of Louis, *Le Grand Monarque*, devised *bouillon* and *consommé*, because mastication was considered vulgar. In reality, the French use of broth in cookery was occasioned by necessity. For France at that time was lacking in oil, butter, and the animal fats, used with spices by other nations for the production of moist dishes of richness and flavor. The French learned many things in cookery from the Italians, but neither the ancients nor the Italians had ever made any application of the broth of meat in general cookery.

The origin of soups in their simpler forms dates back to the childhood of the world. Tyler, in his "Early History of Mankind," refers repeatedly to flesh cooked by the process of "stone boiling," in the paunch or hide of the slaughtered beast; and he says, "For drink they have the broth of the meat." According to the historians, those peoples who cooked their food in this way ranked a grade higher in civilization than they who simply broiled or roasted their meat over the fire, the earliest and simplest form of cookery.

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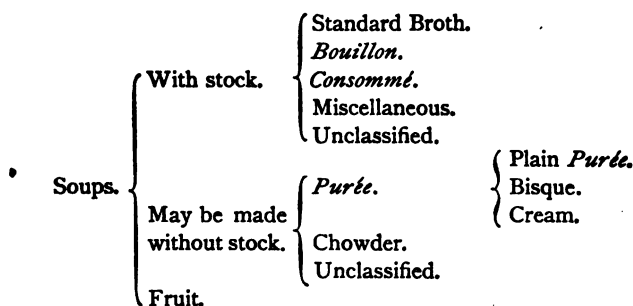
When we feel that the larger part of a day is too much time to be consumed in making soup stock, it may be comforting to consider for a moment the time and labor involved in "stone boiling." Into the hide were put water and the flesh to be cooked, and then the stones, made hot in the fire, were dropped in, to remain until they became cool, when others were put in their places.

Soups are classified, first, in accordance with the presence or absence of "stock" as a foundation. By stock, in soup making, is meant those juices and soluble portions of meat or fish, together with soluble portions of bone and vegetables, which have been extracted by slow cooking and stored for future use. This material is more or less solid after it has become cold, according to the gelatinous nature of the ingredients and the proportions of meat or fish and water it contains. *Bouillon* and *consommé* belong to this class of soups.

Soups made without stock as a basis are called soups *maigre*, from a French word meaning lean or poor. The pottage for which Esau sold his birthright was probably a soup of this kind, being made of the red lentils of Egypt. Many soups of this class, however, are often made with stock as a part of the liquid.

The following outline may serve as a guide to the proper understanding of the subject:

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Fruit soups are quite generally used on the continent of Europe, more particularly in Germany. In this country they are used chiefly as an appetizer or at a luncheon. Besides the general names given above, soups receive special names from their color: as white, brown, or amber; or from the garnishing used, as macaroni, noodle, or *Julienne*.

Soups are thin or thick according to the absence or presence of material that gives body or consistence to the liquid. This material is either *roux*, blond or brown, and made of melted butter and flour, or *meunière*, i. e., flour, cornstarch, or arrowroot mixed with water, one tablespoonful of the former to four of the latter, egg yolks beaten and diluted with cream or milk, two yolks to half a cup of the liquid or starchy material, as barley, rice, sago, tapioca.

Thickenings for Soups	{	<i>Roux.</i> <i>Meunière.</i> Egg Yolks. Grains. Tapioca, etc.
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Roux may be added to any soups that have not been clarified. It is usually added to soups made of the legumes or potatoes. Stir a little of the hot soup gradually into the *roux*, and when smoothly diluted stir the mixture into the soup kettle; stir continuously until the soup boils, then let simmer ten minutes. Add the *meunière* in the same manner as the *roux*, but let cook at least twenty minutes in the soup. Arrowroot may be used in a clear soup—a level tablespoonful to a quart; flour, cornstarch, or arrowroot may be used in other soups. To beaten yolks of eggs diluted with liquid add gradually a little of the hot soup, then stir into the soup, which should not be let rise to boiling point, stir until the egg looks cooked, then turn at once into the tureen. If the soup boils after the egg is cooked, it will present a curdled appearance. Rice or barley is often cooked in a chicken or mutton soup; sago and tapioca may be used in almost any soups excepting cream soups, *purées*, and the like. These may be cooked in a little water and added to the soup or cooked in the stock.

A clear soup is a most fitting and agreeable prelude to a ceremonial dinner. It is a savor to health before any dinner, as it is quickly absorbed by the linings of the stomach and gently stimulates that organ to take care of the more substantial nourishment that is to follow. A cream soup—*purée*, *bisque*, or chowder—is substantial in itself and may fittingly form the chief article of a meal for rich or poor alike.

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Soups with Stock

As cream soups are a means of utilizing whatever vegetables are left over from a previous meal or day, so many a soup made from stock furnishes an opportunity to use up the "odds and ends" of meat and bone that accumulate from day to day. Indeed, if we are to get all the nutriment possible from our various food supplies, it is absolutely necessary to take a part of our food in the form of soup.

Now, by this we do not wish to imply that the stock pot or the soup kettle should be steaming over the fire all the time. Except on some of the hottest summer days, the various odds and ends may be kept on hand for several days, until a sufficient amount is collected, then they may be cooked at once, and the liquor strained and set aside. On no account keep the kettle over the fire day after day. Soups in perfection cannot be drawn from such a source.

Materials Used in Making Stock

Every kind of meat, as beef, mutton, lamb, veal, poultry, game, etc., may be used in stock making, either alone or in combination.

In large families, where roasts of beef, mutton, or poultry are eaten weekly, but little fresh meat need be purchased for soups, unless it be for some formal occasion, when a handsome clear soup is desired. Yet remember that "*ab nihilo, nihil fit.*"

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As the individual or distinctive flavor of different kinds of meat is more highly developed in a cooked than in an uncooked state, and as browned meats give a corresponding color to soup, it is well, particularly in making brown stock, to brown a portion of the meat used in making stock for clear soups.

A small quantity of fat is a wholesome addition to any soup. A part of this will be absorbed by the stock during the cooking process, and the part that is not thus absorbed will rise to the top, forming a solid cake, which may be removed when the stock is cold.

When uncooked meats are used for a soup, the marrow found in the shin of the hind quarter is the best form of fat that can be obtained. In soups made from remnants, the browned fat of roasts gives a good flavor, and occasionally a bit of ham or bacon may be used; only two or three ounces, however, for a large dish of soup, as in a perfectly flavored soup no one savor should predominate.

Expensive cuts of beef are not so well adapted to soup making as the cheaper pieces. The blood flows more freely to those parts of the creature that are in constant use, and though this use toughens the muscles, the life-giving juices are there, and long, slow cooking will remove them. Select then, for stock, the under part of the round, the vein, neck, flank, cheek, and shin, tough and inexpensive pieces, but full of nutriment.

In making fish stock for general use in fish soups or *entrées*, select the white-blooded varieties. The head

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and trimmings are valuable, because they contain gelatinous material, often desirable, and also considerable flesh; but, aside from this, solid pieces of fish containing the albuminous juices are needed. Salmon, lobster, and other red-blooded fish need be used with discretion.

As a general rule, that which is extracted from bones is the least desirable element that enters into a soup; particularly is this the case with beef bones, and if there be no bits of meat upon the bones, there would seem to be little reason for including them in soup making. If bone be used and the liquid be cooked at a high temperature, lime is dissolved into the soup, giving it a cloudy appearance. The bones of chicken and veal are rich in delicate gelatine, and this is often desirable to give body to a soup. Gelatine is also a preservative agent, as stock that jellies, air being excluded, keeps much better than stock in a liquid form.

The Soup Kettle

In making stock all the nutriment and flavors possible are to be drawn out from the various ingredients and retained in the stock; but when once the volatile odors of fowl, vegetable, and herb have escaped from the saucepan and permeated the house, we cannot bring them back again to the soup plate, and this appetizing aroma is lost. So, often nothing is left for serving but a thin, watery liquid, in appearance gray and

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cloudy from the lime extracted from the bones. First of all, then, let the soup kettle be furnished with a tight-fitting cover. And, moreover, let this utensil be of agate or granite ware and as nearly free from blemishes as possible, for acid, found in all flesh, attacks unprotected iron, and thus gives an inky color to the soup. Scrupulous cleanliness is just as essential to the making of a fine-flavored soup as in the making of a fine cup of coffee. Both the coffee pot and the soup kettle must be scoured frequently and well aired after each use.

Temperature and Time of Cooking

The first step in soup making consists in drawing out the soluble juices and flavoring constituents into the water; the second step is in keeping that which has been drawn out in a wholesome and agreeable condition. Since cold water is best fitted to extract juices, cut the meat, after wiping the outside with a damp cloth, into small bits, in order that as much surface as possible may be brought into contact with the water. Break or saw the bones into small pieces, put into the kettle, and add cold water as it is required. After the meat has stood half an hour, or until the water is well colored, place the kettle over the fire and gradually heat the contents to the boiling point and skim; then, in accordance with what has been said before in regard to the coagulation of albumen and other juices of flesh at

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a temperature below 180° F., and the loss of delicacy and digestibility when cooked at higher temperature, let the contents of soup kettle gently simmer or bubble slowly and constantly five or six hours.

A celebrated cook once said: "Let the contents of the soup digester boil but once and the soup is ruined." To some this may seem an extravagant statement; but it loses all such significance when one stops to consider the delicate flavor, the bright sparkle, and rich clearness of a *consommé* or an amber soup that has been cooked at a low temperature, while all are familiar with the strong odor and the cloudy appearance of a soup that has been cooked at a temperature such that the lid of the kettle, when removed, was found covered with particles of coagulated albumen, deposited there by the furiously "galloping" liquid.

Cook, then, meat at a low temperature; cook until it is in rags and colorless, the juice and flavor having been withdrawn. About one hour before this stage is reached add the vegetables and seasonings. Strain off the liquor from the bones, meat, and vegetables, pressing out every drop of juice, and set aside where it will cool quickly.

If the fowl, or any portion of the meat used in soup making, is to be served apart, wait until the contents of the kettle are heated to about 170° F., then put in that which you wish to serve apart from the soup, and allow it to cook at this low temperature until it becomes tender, then remove at once.

CHAPTER VI

Sauces and Entrées

"On devient cuisinier, on devient rotisseur, on nait saucier."

—BRILLAT-SAVARIN.

THIS epigram of a famous French epicure, and our one-time Boston orchestra player, translated into English means: cooking and roasting can be taught, but it takes a genius to make a sauce. It is apt and to the point. Savarin in his "Meditations on Transcendent Gastronomy" wrote nothing more true. There is an indefinable daintiness and delicacy in the flavor and smoothness of a sauce, when it is properly made, that only one endowed with fine sensibilities of taste can justly appreciate, and only such an one, save by some fortuitous accident, can hope to prepare a perfect sauce. Intrust the roasting of a carefully selected joint or fowl to an ordinary cook, and, if she but understand and apply the simplest rules of cookery, your confidence will not have been misplaced and the most epicurean taste will be satisfied. But it is quite another matter when it comes to the preparation of the sauce for the *entrée*.

The *saucier* must of necessity be dexterous in extracting and retaining volatile flavors; she must be able

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to select those that will blend one with the other, and produce a harmony of savors adapted to the particular dish for which it is designed, and this adaptation of sauce to plat consists not only in the harmony, but often in the contrast of savors. Moreover, in the proper adaptation of a sauce, too strong flavors are to be moderated, weak but agreeable ones are to be brought out and accentuated, and dry, plain dishes are to be made moist and enriched. A perfect sauce is a promoter of digestion and an aid to nutrition; when a contrary effect is produced, something is wrong with the sauce.

One of the nice points in making a sauce is that of the temperature of the liquid that is added to the *roux*. A sauce of perfect flavor cannot be made by adding a hot liquid to the hot *roux*. A cold liquid may be added at once, or, if the *roux* be cooled, a warm liquid may be used. In all cases it is safer to add the liquid gradually and with continuous stirring; an expert can add all the cold liquid at once. Then, too, entirely different results are secured by the manner in which the flavor of vegetables and the kitchen bouquet are added to the sauce. A higher and more pronounced, to some more agreeable, flavor is brought out when these are cooked in the butter that is to be used in the *roux*, than when they are merely scalded in the liquid of the sauce.

In menus we often see the dish "Roast Beef *au Jus*." This French appellation is an inheritance from Roman times; *jus* was their word for sauce, but its

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meaning to-day is limited to the juice flowing from the roast or grill when it is cut. It corresponds to the English word gravy—platter gravy. The addition of hot water to beef gravy or *jus* gives *bouillon*.

That the English formerly knew so little of sauces (compounds of juices, *roux*, mirepoix, etc.), save that of melted butter, was occasioned, perhaps, by the fact that they did not feel the need of them. The essence extracted from joints of well-fed beef, mutton, and game was all-sufficient. (Bread sauce is, however, an English production.)

The French, lacking rich, juicy provisions, were in a measure compelled to increase the number of their sauces and bring to a higher degree of perfection those that had been received as an inheritance. When one considers at random the six or seven hundred sauces described in French books of cookery and reads of glaze, mirepoix, blond and brown *roux*, the subject seems quite intricate; but this is not the case. All sauces (as distinguished from gravies) are made consistent or given body by the addition of a thickening or binding agent; or in French, a *liaison*. Making this thickening the basis of division, we may consider:

- | | | |
|-------------------------------------------------------------------------------|---|--------|
| 1. Sauces thickened by <i>roux</i> | { | White. |
| | | Brown. |
| 2. Sauces thickened by egg emulsion.. | { | Hot. |
| | | Cold. |
| 3. Independent sauces—or sauces belonging to no general class—marinades, etc. | | |

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Gouffé reduces the matter of sauces thickened with *roux* to lowest terms when he refers to four fundamental sauces from which all others are made, viz. :

1. *Espagnole*. (Brown.)
2. *Velouté*. (White.)
3. *Allemande*. (Yellow : *velouté* and egg.)
4. *Bechamel*. (White : *velouté* and cream.)

In noting Gouffé's fundamental sauces we see that *Allemande* and *Bechamel* have *velouté* as their basis, so that in reality the subject of sauces, when it is reduced to its "lowest terms," would seem to center round but two: *Espagnole* and *velouté*; or, casting aside all apparent superfluities of flavoring, simmering, and skimming, to the simple, economical, and easily made brown and white sauces most generally used in this country in family cookery. With these simple sauces as a foundation, all the different varieties of French sauces may be made.

Entrées, etc.

An *entrée* is a dish served at dinner or luncheon between the regular courses. Some *entrées* are served hot, and others, from preference, cold or iced. As *entrées* are served from the side, they are often shaped in individual portions; if not so shaped, they are separated into portions before they are passed. Meat, fish, eggs, vegetables, and, occasionally, fruit may form the foundation of an *entrée*. Uncooked meat or fish

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is often used in these dishes, but there is no place in cookery where the cook has such an opportunity to display her skill as in the preparation of *entrées* from materials left over from other dishes. As meats and fish lose flavor in re-cooking, broth or stock to heighten flavor is almost a *sine qua non*, both in the composition of the dish itself and in the sauce with which it is served. Standard broth gives the best results, but broth carefully made from odds and ends of well-selected material is not to be despised. As a means to this same end the appropriate use of celery salt or pepper, curry powder, tabasco sauce, a "faggot," onion, and marinades are to be commended. But, in reality, success in this branch of the culinary art depends largely upon the *manner* in which the fundamental ingredients are handled, and especially is this the case in the composition of *réchauffés*.

Meat or fish that has once been cooked must of necessity be treated thereafter most delicately. As for these the process is one of *reheating*, further *cooking* needs be avoided. It is well to remember the following items:

(1st) That whenever vegetable, sauce, etc., is to be added to cooked fish or meat, it must be thoroughly cooked before being combined with these ingredients for reheating.

(2d) That cooked proteid substance while reheating must be protected in some way from direct contact with the heat of the oven, fat, or fire: as, for in-

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stance, with sauce, buttered crumbs, egg and bread crumbs, pastry cases, etc.

(3d) That the more finely these cooked substances be divided, the shorter the time needed in reheating and the more readily will they absorb sauce or whatever is to give them flavor.

(4th) That all bone, gristle, unsightly or unedible portions need be carefully trimmed away before cooked fish or meat is chopped or otherwise divided.

(5th) That, in chopping, the material is to be *cut* into tangible bits, not *mashed*, and, in slicing or cutting into cubes the divisions are to be uniformly and neatly made.

For convenience, and to insure a better understanding of the subject, hot *entrées* may be considered under four divisions, and the various cold *entrées*, such as *chaudfroids*, aspics, etc., in a class by themselves, as:

1. Simple salpicon (ragout) mixtures or chopped mixtures (either uncooked or *réchauffé*). Served in borders, etc.

2. Salpicon or chopped mixtures, inclosed when cold in egg and bread crumbs, pastry, batter, etc., and fried as *croquettes*, *rissoles*, fritters, *kromeskis*.

3. *Purées* of meat or fish mixed with different proportions of egg, cream, or sauce, panard, etc., to form soufflés, creams, quenelles, mousses, etc.

4. Dishes composed of small pieces of solid meat trimmed to uniform shapes and sizes, as fillets, cutlets, supremes, etc.

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5. Cold *entrées*, as *chaudfroids*, aspics, etc.

There are several utensils that simplify to a great extent the making of *entrées*. The first in importance is a sharp knife of suitable size, then follows a chopping knife, a meat chopper, a mortar and pestle, and a *purée* sieve and wooden spoon. But, in accordance with the *bonmot* of Motley, one might be inclined to do without a sharp knife or a chopping knife, to indulge in the luxury of a meat chopper, if anything so useful and saving of time and strength can be called a luxury.

In selecting sharp knives of various sizes, the best French knives are the cheapest in the end. If a knife will not take and hold an edge it is worthless. The "quick cut" chopping knives made in Canton, Ohio, on account of their shape, are easily cleansed and have more cutting surface than those of other make. They are made of good steel. In meat choppers, one that cuts clean rather than crushes the meat is the kind to purchase. Some machines are so made that with them meat may be cut in large or small pieces. The knife of the Enterprise chopper may be resharpened or an old knife replaced by a new. *Purée* sieves come in different sizes; the size of mesh in the sieve cloth varies according to the use for which it is designed. A sieve with twenty-eight holes to the linear inch is needed for sifting icing sugar. A twelve-mesh sieve, or twelve holes to the linear inch, is adapted to sifting *purées* and marmalades, and an eight mesh for bread crumbs.

CHAPTER VII

Vegetables and Cereals

THE vegetarian society will not have existed in vain, if it does nothing more than teach a goodly number of housewives how to cook vegetables properly and in more ways than one, viz., simply boiled and buttered, for this branch of cookery is much neglected. It is safe to say that not more than one family in twenty, and perhaps not in fifty, ever cook celery, save in soup, or squash and turnip other than as plain boiled or mashed, while potatoes are either plain boiled, boiled and mashed, or fried.

In the cooking of vegetables the economical and thrifty housekeeper can find fit place for the expression of her genius. The flavor of meat is a pleasing one, but meat in roasts and broiling pieces is the most expensive and not infrequently the least satisfactory item of food that is purchased. The French or Italian housekeeper, with small expenditure of money, adds meat flavor to the cooked vegetables—beans, cabbage, cauliflower, macaroni, rice, etc., and thus renders a cheap though nutritious food palatable. Cheese also combines well with many vegetables as it does also with

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grains and macaroni. This making of inexpensive food materials appetizing is the one great end in cookery that the American cook needs to attain.

Many of the fresh vegetables do not possess a high food value, but they are very valuable at all seasons on account of the saline elements which they contain, and in the summer season, when the heat of the body needs to be regulated, they provide for the system large sources of pure water. Different vegetables possess different saline elements, all of which are needed by the system, and each vegetable in season should be given a place on the table.

In hothouses lighted by electric lights market gardeners can transform the short, dark days of the winter solstice into long, light, and growing days—such as are needed for the rapid growth of plant and vegetable. Still, there are but few forced vegetables and fruits that possess the genuine flavor of those that are grown in the natural manner. As a rule, when food is most cheap and plentiful, it is at its best; out of season, it is expensive and lacking in flavor and quality. In the early spring, the provident housekeeper will still make use, to a great extent, of such vegetables and fruits as are seasonable throughout the year, together with such dried articles as she has found most wholesome and palatable, ever bearing in mind how “all things come to him who will but wait.” On account of their tough cellular structure, by far the greater number of vegetables are eaten cooked. Their digestibility depends

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upon the degree of tenderness that can be given to their cellular tissue. Of course the quantity and toughness of cellulose in vegetable products depend much upon the kind of plant, the soil, and the season in which it is grown; but under the most favorable cultivation this framework cannot be entirely eliminated, so that first of all thorough cooking, by which it is softened, is enjoined; soft water is an aid in this process, and, where this is not at hand, the solvent property of the water may be enhanced by the use of a few grains of cooking soda. This addition is less objectionable in the case of strong-juiced vegetables, like cabbage and onions, cooked in a large quantity of water to lessen the disagreeable flavor or constituents (as sulphur), and from which the water is to be carefully drained before serving. Quite a different plan should be pursued with the sweet-juiced vegetables, as peas and young beans. Of these soda would destroy the delicate green color, while salt would intensify it; little salt, however, should be used, as the water in which these vegetables are cooked holds in solution much of the sweet juices and mineral salts, their most valuable constituents, and should be retained for serving with them.

Rapid cooking is desirable for strong-juiced vegetables, while a gentle simmering is preferable for the sweet-juiced varieties. When the vegetable is to be dressed with butter, the heat of the vegetable should be sufficient to melt the butter.

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Use of Salt in Boiling Vegetables

Salt is added to vegetables for savor and, in some cases, to help retain the color of green-colored vegetables, as spinach, peas, asparagus, etc. Salt tends to draw out the juices and toughen fiber. Consequently, if color and savor are preferred to texture, or if the vegetables are quickly grown, fresh, and tender, use salt. If the vegetables are wilted and in consequence liable to be tough, add the salt just as they are done, thereby sacrificing color to tenderness. Potatoes, either white or sweet, that are usually tender when boiled, are best boiled in salted water. All vegetables may be made more delicate in flavor by blanching. To blanch, cover the vegetable with cold water, let boil five minutes, then drain and rinse in cold water; drain again, then cook as usual.

Those who live in the country may plant a garden, have a "canner" of some kind, and in time of plenty "put up" vegetables and fruit for winter use. Even those who have no fruit trees often put up fruit. Young and tender asparagus, peas, string beans, beets, and sweet corn, when these are obtainable, may be canned most successfully, and prove truly delectable in taste. But when the home supplies run short, then is the time to find out the possibilities of dried vegetables and fruit; and few know how tempting they may be made. Dried lima beans, lentils, and flageolets (French beans) soaked in cold water overnight cook

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quickly, and may be served with butter, cream, or sauces; with more labor, they may be transformed into soups, *croquettes*, soufflés, salads, etc. Tomatoes in combination or in sauces give variations to these dishes, and, combined with a suspicion of onion, impart flavor, which at the present time is demanded in all good cookery.

Once having tried celery *au gratin*—celery alone or with cheese and oysters—or celery in a brown sauce flavored with kitchen bouquet, no part of the head of celery need go to waste. Of course, in any of these dishes whole heads of celery may be used, but, as a matter of economy, the tender inner stalks may be reserved for a “savory,” and the coarse outer stalks, that are not palatable uncooked, may be presented in one of the most pleasing little *entrées* mentioned above. These, properly seasoned and flavored, in addition to their palatability give quite an “air” to an ordinary home dinner. Note that the celery will need cooking at least an hour.

Steaming Vegetables

Vegetables from which the liquid is to be drained may be more satisfactorily cooked by steaming than by boiling. This is especially true of squash and vegetables belonging to the cabbage family. As rapid cooking is desirable, the steamer may be placed directly over the fire. Then, if the steamer be properly con-

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structed and the range connected with the chimney, all odor from the cooking vegetables is carried out of the house up the chimney. If plenty of water be supplied at the start, the steamer need not be opened except to test the extent of cooking.

When Preparing Canned Vegetables

It is well to remember that all canned goods are better if the cans be opened some little time before using, that the contents may come in contact with a fresh supply of oxygen. It is needless to add, perhaps, that it is a wholesome precaution to remove the contents from the can at once, after it has been opened. Acid fruits, tomatoes, etc., must be removed at once, or ill effects may result from their use.

Peas, beans, and, in fact, all vegetables, used apart from the liquid in which they are preserved, should be thoroughly rinsed in cold water, and then scalded quickly in hot water and drained. They are then ready for seasoning and serving in any manner desired; a little sugar (a teaspoonful to a can) will improve the taste of peas. Rusty or leaky cans, or cans bulging at the end, should always be discarded. To simplify the matter of cooking vegetables, the things to be determined are: is salt or no salt to be used? is much or little water required? should this be hot or cold? and also is the cooking to be slow or rapid? These things can be best determined by considering whether the veg-

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etable in question be strong- or sweet-juiced, fresh-gathered, wilted, or dried.

Breakfast Cereals

Steam-cooked cereals *can* be eaten without much time being given to their preparation, and in consequence their consumption is enormous. Many children are permitted, morning after morning, to make a full breakfast of cereal. While a child with strong digestive powers may appear for a time to thrive upon such diet, it becomes a fruitful source of dyspepsia. Many a dish of oatmeal, sugared and deluged with milk, causes acidity of the stomach or heartburn, which is wrongfully ascribed to other causes. The trouble lies not so much with the cereals themselves—though some are more prone to produce digestive disturbance than others—as it does with the manner of cooking and masticating. Cereals are largely composed of starch and tough woody fiber, hence long and thorough cooking and thorough mastication are prime requisites to insure the digestive action of the saliva. In cooking cereals, then, use enough water *to swell the grains to their full extent, but avoid having the mush too soft, else it is liable to be swallowed without mastication.* As starch during the process of digestion is changed into sugar, sugar as an accompaniment to cereals would be contraindicated. Indeed, cooked until quite stiff, they are most acceptably served with butter

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or cream as a vegetable with meat and in the place of potatoes. More time is required for the conversion of the starch in oatmeal into sugar than for the starch in barley, and thus barley would be considered the cereal for sedentary people. The large proportion of fat in oats and corn fit them more particularly for mid-winter consumption.

Cooking Cereals

Breakfast cereals may be boiled or dry-steamed, i. e., cooked in a double boiler; the latter method requires longer time in cooking, but it is usually preferred, as less attention is demanded. A supply of water needs always be kept in the boiler. A general rule for cooking cereals is as follows: add a teaspoonful of salt to a quart of water boiling directly over the fire; into this stir about a cup of the cereal and, when the mixture boils, after all the cereal has been added, set over hot water and cook, without stirring, the requisite time. Whole grains of oatmeal require in cooking about six hours, hominy four hours, samp eight or more, cracked wheat two hours, Indian meal three to six hours, and rice about forty minutes. In cooking cereals from packages it is safe to double the time given in the directions on the packages.

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Serving Cereals

The various cereals have distinctive yet delicate flavors of their own that are usually enjoyed, but occasionally, for the sake of variety, fruit flavors may be added. Sweet fruits would be indicated. Raisins should be added with the salt to the water in which the cereal is to be cooked. After removing the seeds from dates, cut into quarters and stir into the cooked cereal; cover and return to the range long enough to heat the fruit thoroughly. Prunes and figs should be stewed previously until tender, then served hot or cold with the cereal. Bananas may be sliced without cooking, and then served with the hot cereal; but even these will be found to be more agreeable if they be cooked.

CHAPTER VIII

Marketing, Care of Food and Cooking Utensils

THERE are two ways of marketing in vogue, both of which have ardent advocates. By the one, and this is largely practiced by the women of Mexico and France, the housekeeper buys just what is needed for the day, no more, no less, and when night comes her storeroom is as bare as that of the historic Mother Hubbard on a certain occasion. The other might be called the American way, though it follows pretty closely the fashion set by our English cousins. A housekeeper who believes in this way of marketing buys her provisions almost at wholesale—that is, sugar and flour by the barrel, butter by the firkin, and canned goods by the dozen.

The Mexican woman brings home her food supplies of all kinds, for the day, in a small gourd cup holding less than a quart. The French woman buys the wings and perhaps the second joints of a fowl. The English or American woman, of the same class, would be unwilling to ask for less than a pair of fowl, and very likely would add a ham or a pickled tongue. Without doubt the former is the more economical

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method of procedure; still there is a satisfaction in the consciousness that one's larder is supplied for an emergency, which will compensate for the extra outlay, if that outlay be commensurate with one's income. But the purchase of supplies for a family, if it be wisely done, whether the family be large or small, is no very simple matter. It cannot be prescribed for every class and condition of housewives. But whether one buy by wholesale or after the French fashion, serve yourself if you would be well served. Go in person and see what you purchase.

Supplies that May be Bought in Quantity

White flour may be bought by the barrel, if one has a cool, dry place for its storage. The barrel should not rest directly upon the floor, but be raised from it by strong supports, so that there may be a circulation of air below as well as upon the sides and top. Entire wheat flour does not keep well and needs be bought a little at a time. Potatoes keep well and are lower in price, before they have been stored. With refrigerator and ice, butter and meats can be well taken care of and, besides, the meat be much improved by the keeping. A loin of beef or a side of mutton is a profitable investment in the average family. Serve the fore quarter of mutton, "boiled" or steamed, first, as meat thus cooked needs be fresher than when it is roasted. The leg may be kept till the last. If one has no facil-

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ities for taking care of meat, she can sometimes purchase the side or loin of the dealer, and he will keep it, cutting and sending as ordered; but one, probably, will pay extra for such attention. At some markets, when a loin of beef is purchased the dealer will remove the flank. If this part can be utilized, the rule of economy is subserved. The flank may be made into Hamburg steak or cannelon of beef, or it may be kept a few days and then salted, thus being preserved for future use.

The fillet spoils very quickly and should be served first. It may be roasted, braised, or cut in slices and broiled. Being deficient in flavor, it is usually larded; if braised, the flavor of vegetables is added, and if broiled, it is quite often served with a mushroom sauce. Cut the rest of the loin into steaks and roasts. Do not roast meat the day it comes from the market, unless you are sure that it has been kept long enough to be tender. Do not waste needful force in trying to digest tough roasts. One better purchase less expensive meat, chop in the meat chopper, fashion into compact roll, and then roast *en masse*.

Bacon

A crisp, translucent curl of bacon gives relish to many a dish; buy only the best; tough bacon, unless the fat cooked from it be used in basting roasts, is a total loss. In many sections of the country, partic-

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ularly in Canada, sides of tender, mild-cured bacon may be procured. Every slice of the "Deerfoot Farm" bacon, put up in one- and two-pound boxes, may be depended upon as being tender and of good quality.

Milk

Though milk does not sour as quickly in winter as during the hot weather, it should receive just as much care. Whenever it is possible, keep milk in a separate compartment of the refrigerator and *never* leave it uncovered. There is nothing gained by paying extra for milk of assured cleanliness, or that has been pasteurized, if it be left standing uncovered. Nor should milk or any food supply, even if covered, be left in the hot kitchen an hour or two. And especially no cooked food should be left uncovered. To the strong and robust such food may not occasion sickness, but a delicate child or an invalid will scarcely escape ill results from partaking of the same, and it is no longer palatable to anyone.

Food in Season

As a rule, when food is most cheap and plentiful, it is at its best; out of season, it is expensive and lacking in flavor and quality. In the early spring the provident housekeeper will make use, to a great extent, of vegetables and fruits which are seasonable throughout the year, together with such dried and canned

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articles as she has found most wholesome and palatable, ever bearing in mind how "all things come to him who will but wait."

Poultry, etc., in Season

Beef, all the year, best, November to March; mutton, all the year, best, November to April; veal, all the year, best, April and May; lamb, house, December 25th to July, yearling, best, August to November; pork, best, October to March; turkey, and fowl, best, October to March; chickens to broil, August, incubator, all the year; pigeons and squabs, stall fed, all the year; ducklings, May to December; domestic duck and geese, September to May.

Cooking Appliances and Care of Same

To prepare three meals a day in a family of five or six members requires the constant attendance in the kitchen of at least one person, and often several people are occupied there. Even in a small family the kitchen is a much-used room. Hence in the kitchen plenty of light and good ventilation are of utmost importance. The health of the family depends both directly and indirectly upon these conditions. That food absorbs odors and germs, not only in storage but also while cooking and cooling after cooking, should not be ignored. Then, first of all, let us have a light, roomy, and well-ventilated kitchen.

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In every kitchen furnished with a coal range there should be some means of quick cooking; this will be found economical in point of money and time. Indeed, where the coal range is not needed for heating as well as cooking, a range that affords quicker service is demanded. At the present time, in all large towns and cities the gas range is available; this in use should be provided with a hood or flue connected with the chimney, to remove products of combustion. Experience suggests many devices in the use of a gas range, and there are appliances by which the quantity of gas consumed may be diminished.

The tile-lined ovens used in foreign lands are washed after the cooking of each article, to insure against the absorption of flavor by the next dish that is to occupy the oven, a suggestion that is worthy of notice. In planning a kitchen, a place for the refrigerator should be selected with care; its drain pipe ought not to be connected directly with the sewer. If possible, let the compartment for ice open on a piazza or, at least, out of doors. The refrigerator should be easy of access to the cook, for fine cooking demands many trips between the cooking table and ice receptacle.

Care of Refrigerator

Three things are essential to the proper care and use of a refrigerator: cleaning the waste pipes, instant removal of anything spilled, and a full supply of ice.

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If the compartments in which food is kept be wiped out carefully once a week, no crumbs, drops of liquid, or particles of food being left to accumulate meanwhile, these will need no other attention. Once a week let the ice supply run low, then remove the ice, wash the floor under the rack upon which the ice rests, take out trap and removable drain pipe and, with a cloth fastened to a rod or wire, clean out these with a strong solution of sal soda. Pour the same down the remainder of the waste pipe, making sure that the pipe is cleaned as far down as it can be reached. Keep the ice compartment filled with ice. A large body of ice keeps better than a small one, and insures better circulation of air. Keep the doors closed. Set milk in closed bottles or in a compartment by itself.

Cooking Utensils

It is a positive pleasure to the workman in any calling to own and use good and appropriate tools. The truly good cook takes scrupulous care of her cooking utensils, and comes to have a real fondness for certain dishes. The supply of utensils should, however, only equal the demand, for all the good things in this world are of value to us only in so far as we can make a valid use of them.

The heavy ironware and the more expensive copper utensils, recipients of endless polish, are now improved upon, save, perhaps, in point of durability and

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for some special uses. There is agate ware, and a light blue ware, white inside (imported), also a lightweight steelware, and aluminoid ware—these afford ample variety for choice, and with careful usage the vessels may be kept in good condition for years. All may be washed, inside and out, with soapy water, rinsed in boiling water, and carefully dried with a towel. If more drying be required, let stand on the shelf of the range. The agate and German wares “chip” badly under strong, dry heat. Fill all cooking dishes with water immediately after use. Sapolio, “kitchen and hand” soap, and sal soda will remove stains that adhere—except in the case of aluminoid ware. Alkalies like baking soda and sal-soda tarnish aluminoid. Also the highly polished *exterior* of aluminoid utensils scratches easily, and for repolishing these a paste made of sifted whiting and soapy water is more satisfactory. Rub over the surfaces with the paste, let dry, then polish with a clean, soft cloth.

Old, linty dishcloths and coffee grounds, in conjunction with grease, occasion most of the calls for the plumber as far as the kitchen sink is concerned, and are a source to him of no inconsiderable revenue yearly. A fine sieve should first receive all waste water in its passage through the sink. New cloth should always be taken for dishcloths and, as soon as signs of wear appear, these may be utilized in wiping out greasy dishes, then in kindling the fire. Add dissolved soap or sal soda (ammonia or caustic soda are better

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because stronger) to greasy water; these form emulsions (soaps) with the fats which pass through the pipes. Three or four times a week flush the drain with a boiling solution of sal soda, using half a cup of sal soda to three quarts of water.

Many housekeepers seem to think that if the tableware be carefully washed other dishes will do without much attention. This is an extremely erroneous idea. Every dish in which food is to be placed should receive scrupulous attention. Smooth, clean dishes are always a chief requisite in good cooking, and in sauce making they are absolutely a *sine qua non*. A sauce is used to give richness and flavor to that which is without these desirable elements. If the dish be not sweet and clean, or if it be rough, so that the sauce burns, or "catches on," as we say, at any point, those are the flavors carried by the sauce; for butter absorbs odors and flavors most persistently. Nor will any amount of outside flavor, that may be added, cover up those that have been, as it were, burned into the foundation of the sauce. No particle of matter remains long unchanged. Bacteria are ever at work, and if we do not wish to introduce undesirable elements into bread, cake, etc., dishes with painstaking care must be made ready to receive the ingredients that enter into their composition.

Part V

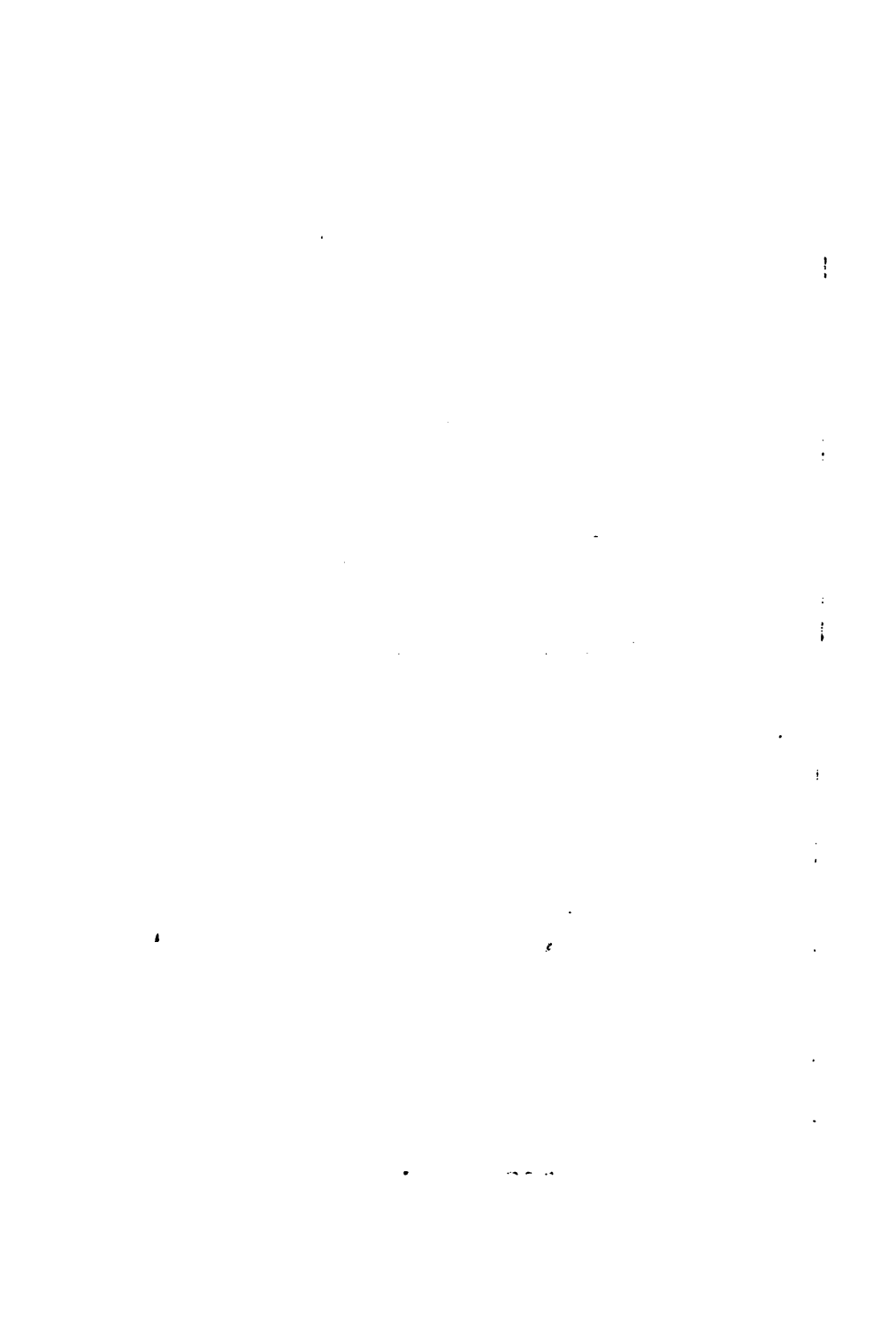
MEDICINES IN THE FAMILY

BY

KENELM WINSLOW

AND

ALBERT WARREN FERRIS



CHAPTER I

The Medicine Chest

Necessary Contents—How to tell Temperature of Patient—Normal Pulse and Respiration—The Hypodermic Syringe—How to use a Catheter—Doses of Drugs—Receipts for the Sick and Babies.

BESIDES the necessary drugs, the medicine chest should contain the necessary instruments for measuring doses. It should also be arranged for dispensing medicines quickly and conveniently. It should have two dozen small flat boxes with sliding tops and labels, for holding tablets or powders. Two most important articles are: a glass graduate, measuring up to two ounces, and a minim graduate. The latter is useful in the case of powerful medicines. Drops vary in size according to the dimensions of the bottle or the character of the liquid. All medicine in fluid form should be dosed in minims. Dry tablets are the easiest form of medicine to dispense; many drugs, however, are inert when dried and compressed, such, for instance, as many of the tinctures. A teaspoon of the old style holds approximately a dram, or sixty minims, and a tablespoon about half an ounce. A sherry wineglass holds about two ounces, and a glass tumbler holds about eight ounces, or half a pint. The chest should contain

The Medicine Chest

a small pair of scales, with brass weights, measuring from half a grain to two drams.

The medicine chest should not be kept locked; valuable time might be lost in searching for the key, when prompt aid is necessary. It should, however, be kept out of the reach of children.

The following drugs, etc., should also be included in the contents:

Alcohol (for external use).	Dobell's solution.
Aromatic spirit of ammonia.	Dover's powder.
Ammonia, water of.	Ginger, tincture of.
Ammonium and codeine tablets.	Ipecac, powdered.
Aconite, tincture of.	Ipecac, wine of.
Aloin, belladonna and podophyllin tablets.	Ipecac, sirup of.
Boracic (or boric) acid.	Iodine, tincture of.
Bromide of sodium.	Lead and opium wash.
Blaud's pills of iron.	Magnesia citrate.
Bismuth subnitrate.	Magnesia sulphate (Epsom salt).
Calomel.	Morphine tablets.
Chloral.	Mustard leaves.
Compound cathartic pills.	Niter, sweet spirit of.
Cholera mixture.	Opium, tincture of.
Castor oil.	Ointment of ichthyol.
Chalk mixture.	Phenacetin tablets.
	Peppermint water.
	Paregoric.
	Quinine.

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Rochelle salt.	Cup.
Rhubarb and soda mixture.	Stomach tube.
Soda, bicarbonate of.	Catheters.
Turpentine.	Thermometer.
Whisky.	Mercury bichloride tablets.
Stimulating liniment.	Ether.
Limewater.	Scissors.
Linseed oil.	Chloroform.
Glycerin.	Bandages.
Vaseline.	Adhesive plaster.
Atomizer.	Corks ; rubber stoppers.
Rubber ring.	Labels.
Corkscrew.	Fountain syringe.
Spoons.	

The casual, as well as the critical, reader of this work knows that a much more intelligent idea of a patient's condition will be gained by the observer if the temperature, rapidity of pulse, and frequency of respiration are ascertained. Upon these three conditions may rest the diagnosis of a disease.

TEMPERATURE.—The presence or absence of fever cannot be ascertained with certainty by feeling of the skin. Cold hands and feet may persist during fever. In fact, during the chill of ordinary malaria, when the surface is cold, the teeth are chattering and the patient asks for hot drinks and heavy bedclothing, his temperature is at least 102° F.

Temperature

To ascertain the real temperature, a clinical self-registering thermometer is essential; this may be purchased for seventy-five cents or a dollar. The half-minute or one-minute thermometers are more convenient by reason of rapidity of registering, but their bulbs are more fragile. The thermometer is provided with a scale, showing degrees divided into fifths, and generally running from 90° to 110° F. An arrow marks $98\frac{3}{8}^{\circ}$, which is the temperature of normal health. A temperature of 100° F., or over, denotes fever, but a less rise over the normal is usually disregarded. A temperature below normal is sometimes seen in health, but unless it persists at 97° F., or less, it may be disregarded.

To use the thermometer, take it by the upper end, with the bulb containing the mercury downward, and swing it back and behind you vigorously, or jerk it through the air as if snapping a whip. This handling must be repeated till the mercury descends at least as low as 96° F. The bulb of the instrument is then placed end under the patient's tongue, who is instructed not to close the teeth, but to close the lips tightly around the thermometer and breathe through the nose. It must be left in this position for a minute more than it is marked; that is, a minute thermometer must be exposed two minutes. The thermometer may be placed in the armpit, which has first been wiped dry, and the skin or flesh of the arm grasped so as to press it tightly against the thermometer, thus holding it in

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an air-tight receptacle. In the case of children, to avoid risk of breaking, the thermometer may be inserted into the rectum for an inch or two, the patient's feet being held in the air, and the instrument having previously been oiled. Although the child may cry, the operation is painless. After removing the thermometer, the scale is read, and the instrument washed with soap and cold water, and put into its case. Hot water sends the column of mercury up to the end of the tube violently, and generally bursts the tube.

PULSE.—The pulse rate at different ages is as follows:

At birth	130 to 150;
At 1 month	120 to 140;
At 1 to 6 months	130;
At 6 months to 1 year.....	120;
At 1 to 2 years.....	110 to 120;
At 2 to 4 years.....	90 to 110;
At 6 to 10 years.....	90 to 100;
At 10 to 14 years.....	80 to 90;
Normal pulse in an adult....	72.

The preceding table shows in a general way the number of heart-beats in one minute. The pulse may be taken by lightly placing the tips of three fingers upon the wrist over the radial artery, which is to be felt on the front of the wrist, about half an inch from the edge of the thumb side and one inch below the base of the

The Respiration or Breathing

thumb. In children it may be felt by placing the fingers on the side of the neck under the ear, or on the left breast over the heart itself. The pulse in children varies much, and increases on the slightest exercise or excitement. It is less rapid during sleep. The usual pulse of healthy adults varies considerably; it is rarely as low as forty and occasionally runs above eighty. In fever there is ordinarily an increase of eight to ten beats over seventy-two for each additional degree of temperature.

THE RESPIRATION OR BREATHING.—The rapidity of respirations in health per minute is seen in the following table:

In babies from birth to the age of 3 weeks..	40;
In babies from 3 weeks to the age of 1 year..	30;
During the second year.....	28;
From the second to the fourth year.....	25;
From the fourth to the fifteenth year.....	20 to 25;
In adults	16 to 18.

By a respiration is meant the inspiration and expiration taken together. In counting the respirations, place the open palm upon the chest, or in children and men upon the abdomen, and count each time the chest or abdomen expands, or merely watch the rise of the chest or abdomen.

In children the breathing is often very irregular; a child may hold his breath and even take several

breaths in rapid succession. Breathing is more rapid in fevers and diseases of the chest. In fever there is an increase of about one respiration to each three or four additional heart-beats above the natural rate—seventy-two in the adult. The breathing in grave cases of pneumonia may be as rapid as forty in adults, or sixty in babies. The breathing is noisy and crowing when there is any obstruction in the throat, as in diphtheria or croup; noisy and snoring in unconscious persons. (See *Disease of Throat and Cough*, Vol. II.)

THE TONGUE.—In most cases the appearance of the tongue is not of much importance, the popular notion to the contrary notwithstanding. When it is coated it often signifies that the digestion is disturbed, but there are many persons in comparative health whose tongues are habitually coated. A yellow coating frequently signifies that the patient's digestion is disordered unless the tongue is stained by something in the mouth, as tobacco. Peculiar conditions of the tongue are characteristic of some disorders, however.

THE PASSAGES FROM THE BOWELS.—During the first few days after birth the passages are blackish and sticky, but as soon as the baby receives milk they become creamy and of a bright, light-yellow color without much odor, and often containing whitish lumps or curds, if more milk is taken than is digested. During the first weeks of life, there are from two to four movements daily. From two months to two years of age the movements number from one to three daily,

The Hypodermic Syringe

and after two years they become formed and possess the characteristic odor of excrement. A greenish color in babies often signifies indigestion, and much slime or mucus suggests catarrh or irritation of the bowels. Bismuth or iron taken as medicine, and also blood stains the passages black. Clay-colored passages generally mean some obstruction to the flow of bile into the bowels. They accompany jaundice. Special appearances of the passages are described under digestive disorders.

THE HYPODERMIC SYRINGE.—When a patient is suffering severe pain and unable to retain drugs in the stomach, the injection of morphine¹ under the skin is of great advantage. Many other drugs are best given hypodermically, but only by a trained nurse or physician. Rapidity and certainty of action are also attained by this method.

A description of the mode of administering drugs under the skin is here given for the benefit of those who may have the care of sick persons and be unable to secure a physician. A hypodermic syringe usually holds about thirty minims, or drops, of water. The medicine used is commonly carried in the form of tablets, one of which is dissolved by placing it in a clean teaspoon, not more than a quarter filled with pure water. If a burning match or alcohol lamp is held under the spoon the water will quickly boil; this not only sterilizes the water, but hastens the solution of the tablet. The syringe should be washed out by drawing

¹ Caution. Dangerous. Use only on physician's advice.

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up boiling water into it a number of times through the needle, and the outside of the needle should be wiped with a clean towel wet with alcohol, or the needle should be dipped in boiling water. The water in which the tablet is dissolved is then drawn up into the syringe, including the last drop; then the syringe is held with the needle pointing upward, and by pushing in the plunger until the solution begins to flow out of the needle, all air is expelled.

The injection is generally made in the forearm. The skin on the front part of the arm, midway between the wrist and elbow, is thoroughly cleansed with soap and water and washed with alcohol, if at hand. A fold of skin is then picked up between the thumb and forefinger of the left hand and pinched firmly to prevent pain from the needle prick. Then with the syringe grasped in the right hand, the needle is thrust quickly into the fold of skin thus raised. The needle should be introduced one-half to one inch, almost parallel with the surface of the arm, into the middle of the fold of skin held up; not deep into the flesh of the arm. The liquid is slowly injected and the needle rapidly withdrawn.

The process is exceedingly simple and without danger, if the needle, syringe, and skin of the patient are clean, and air is first pushed out of the syringe. The metal syringes with solid plungers are likely to prove most satisfactory if the plunger is kept greased. A patient should never attempt to use the hypodermic syringe on himself. Many drugs are administered with

The Use of the Catheter

the hypodermic syringe, but morphine is given most often in this way. Not more than a quarter of a grain should be injected at a time in most cases, but if no relief is experienced within half an hour the same dose may be repeated at half-hour intervals in adults until relief from pain is obtained. In weak women it is advisable not to give more than one-eighth grain at a dose. Morphine is to be shunned in troubles where pain is chronic, as the morphine habit is readily acquired, and overcome, if at all, only by decided force of will and much suffering.

THE USE OF THE CATHETER.—In case of retention of urine from various causes (Vol. II, p. 218), it may become necessary to use a catheter in order to relieve suffering, if not to save life. A catheter is a flexible tube, generally of rubber, open at one end and often closed with a solid point at the other, but having an opening or eye near the closed end through which the urine may flow when introduced into the bladder.

There are two forms of catheter suitable for general use. The best is the soft-rubber catheter, called also Nélaton's or Jacques's; and the other is the more rigid, silk-web or English gum catheter. The soft-rubber catheter should always be selected in preference to the web catheters, unless the soft catheter cannot be passed, when the web catheter may be tried, but the stylet or wire, which is sometimes inserted in this catheter when bought, must first be withdrawn. If the catheter were introduced by unskillful hands, with the

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wire in it, damage to the organ might easily result. The soft-rubber catheter should be boiled in water for five minutes before it is used, in order to kill any germs which may be attached to it. This is also the best way of preparing the silk-web catheters, but only the most expensive and finest make will stand boiling many times. After using, catheters should be thoroughly washed in warm water and soap, and a stream of clean hot water be allowed to run through them. They should be kept wrapped in a clean towel or in a long case made for the purpose and not coiled.

The solid point of the catheter containing the eye is the end to be introduced into the urinary passage. The parts about the urinary passage in the female must be thoroughly washed in soap and water. The hands of the operator must be scrupulously clean. The catheter, after boiling, must not come in contact with anything except the urinary passage and the clean hands of the operator. A towel, which has previously been boiled, should be spread over the patient to prevent the catheter from touching the skin or the bed. The patient should lie down with the shoulders slightly raised and the thighs bent so that the knees are in the air. It is important that the patient should be relaxed and keep the mouth open while the instrument is being introduced. The penis of the male is grasped by the left hand of the operator who stretches it upward toward the middle of the belly and separates the lips of the urinary passage with the forefinger and thumb of the

The Use of the Catheter

same hand, while the catheter, which has been dipped into liquid vaseline or glycerin, is passed slowly and gently, a quarter of an inch at a time, into the urinary passage.

It is impossible to infect a patient in using the soft-rubber catheter if proper cleanliness is observed. When the catheter enters the bladder the urine will begin to flow from the outside end of the catheter into a vessel provided for the purpose. After the bladder is emptied the catheter is withdrawn while pinching together its outer end to prevent the urine which is contained in it from leaking out. In females, the urinary passage begins in a little depression, easily found if the outer folds are separated, directly above the entrance to the vagina. Catheterizing a woman is very easy if the entrance to the passage is seen. In case catheterizing is difficult in the male and the instrument sticks at some point, it must be withdrawn for a little way and then pushed in again, or a different size must be used. If this is not successful the more rigid silk-web catheter may be tried, but no metal instrument should ever be introduced by an unskillful person.

The average size of catheter for the average patient, male or female, is No. 15 French, 8 English, or 10 American, according to which scale is used. A short glass catheter is often used for women, but the soft-rubber catheter is by far the best instrument. If voluntary passage of urine is impossible the catheter should be used about once in eight hours. The chief danger in

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using catheters is the introduction of germs into the bladder causing inflammation of that organ. Only absolute cleanliness will prevent such a result.

DOSES OF DRUGS.—The doses given in the following table are for adults. Fractional doses, suitable for those under adult age, are as follows:

For 16 years.....	$\frac{3}{4}$	the adult dose
For 12 years.....	$\frac{1}{2}$	“ “ “
For 8 to 10 years.....	$\frac{2}{3}$	“ “ “
For 6 years.....	$\frac{1}{3}$	“ “ “
For 3 years.....	$\frac{1}{6}$	“ “ “
For 2 years.....	$\frac{1}{4}$	“ “ “
For 1 year.....	$\frac{1}{10}$	“ “ “
For 9 months.....	$\frac{1}{15}$	“ “ “
For 6 months.....	$\frac{1}{20}$	“ “ “
From birth to 3 months...	$\frac{1}{80}$	“ “ “

In the table, the drugs which are marked with a star are powerful, and may cause poisoning if given in a large dose, or if repeated frequently, or oftener than once in a few hours. Many of these drugs may be bought in tablet form.

Arsenic,*	$\frac{1}{50}$ grain.
Fowler's solution of arsenic,*	3 minims.
Boric acid,	5 to 10 grains.
Aconite, tincture of,*	2 minims.

Doses of Drugs

Alum, as emetic,	30 to 60 grains.
Ammonia, aromatic spirit of,	$\frac{1}{2}$ to 1 teaspoonful.
Ammonia, solution of acetate of,	1 teaspoonful.
Ammonium chloride,	4 grains.
Amyl nitrite by inhalation,	5 minims.
Apomorphine (emetic),*	$\frac{1}{10}$ grain.
Atropine sulphate, *	$\frac{1}{100}$ grain.
Belladonna, solid extract of, *	$\frac{1}{4}$ grain.
Belladonna, tincture of, *	2 to 5 minims.
Bismuth subcarbonate,	20 grains.
Bismuth subnitrate,	20 grains.
Bromoform, *	5 to 10 minims.
Calomel,	$\frac{1}{8}$ grain, repeated doses; 3 to 5 grains as a single dose.
Camphor,	5 grains.
Camphor, spirit of,	15 minims.
Capsicum (red pepper),	1 grain.
Capsicum, tincture of,	3 minims.
Cascara sagrada, fluid extract of,	10 to 30 minims.
Castor oil,	Adult, 1 to 2 tablespoonfuls; child, 1 to 2 teaspoonfuls.
Cerium oxalate,	3 grains.

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Chalk, prepared,	15 to 30 grains.
Chalk mixture,	1 to 2 ounces.
Chloral,*	5 to 10 grains.
Chloroform,*	5 to 10 minims.
Chloroform, spirit of,	$\frac{1}{2}$ to 1 dram.
Cinchona, compound tincture of,	1 dram.
Codeine,*	$\frac{1}{4}$ grain.
Colchicum, tincture of,*	10 minims.
Colchicum, wine of,*	10 minims.
Digitalis, tincture of,*	1 to 5 minims.
Dover's powder (opium and ipecac),*	10 grains.
Ergot, fluid extract of,	1 dram.
Ether,*	10 to 30 minims.
Nitrous ether, spirit of,	$\frac{1}{2}$ dram.
Gentian, tincture of,	1 dram.
Ginger, fluid extract of,	10 to 30 minims.
Hamamelis fluid extract (witch-hazel),	1 dram.
Hyoscine hydrobromate,*	$\frac{1}{100}$ grain.
Hypophosphates, compound, sirup of,	1 dram.
Ipecac, sirup of,	$\frac{1}{2}$ to 1 dram.
Ipecac, wine of,	$\frac{1}{2}$ to 1 dram.
Ipecac, wine or sirup, as emetic,	3 to 6 drams.
Ipecac, powdered, as emetic,	30 grains.

Doses of Drugs

Iron (Blaud's pills), sub- carbonate of,	5 grains.
Iron, sirup of iodide of,	5 minims.
Iron and quinine citrate,	10 grains.
Laudanum (see opium, tincture of),	5 to 10 minims.
Limewater,	4 drams.
Lithium citrate,	5 grains.
Magnesia,	15 grains.
Magnesium citrate, solu- tion of,	6 ounces.
Magnesium sulphate (Ep- som salt),	1 to 4 drams.
Male fern,* oleoresin of,	$\frac{1}{2}$ to 1 dram.
Malt, extract of,	1 to 2 drams.
Mercury, blue pills,	3 to 10 grains.
¹ Morphine * and its salts,	$\frac{1}{8}$ to $\frac{1}{3}$ grain.
Nux vomica,* tincture of,	10 minims.
¹ Opium,* extract of,	$\frac{1}{8}$ to $\frac{1}{3}$ grain.
Opium, tincture of (laud- anum),	5 to 10 minims.
Opium, camphorated tinc- ture of (paregoric),	1 to 4 drams.
Pancreatin,	10 grains.
¹ Paregoric,*	1 to 4 drams.
Peppermint, oil of,	2 to 5 minims.
Peppermint, essence or spirit of,	$\frac{1}{2}$ to 1 dram.

¹ Caution. Dangerous. Use only on physician's prescription.

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Pepsin and saccharated	
pepsin,	15 grains to 1 dram.
Phenacetin,*	3 to 10 grains.
Potassium, bromide of,	10 to 30 grains.
Potassium, citrate of,	15 to 60 grains.
Potassium, iodide of,	5 to 15 grains.
Quinine sulphate or tan- nate,	2 to 20 grains.
Rhubarb, aromatic sirup of,	1 to 4 drams.
Rhubarb, tincture of,	$\frac{1}{2}$ to 1 dram.
Salol and salophen,	5 to 10 grains.
Salts, Epsom,	1 even tablespoonful.
Salts, Rochelle,	1 heaped teaspoonful.
Salts, Glauber's,	1 to 3 heaped teaspoon- fuls.
Santonin,*	1 to 4 grains.
Senna, sirup of,	1 to 4 drams.
Silver, nitrate of,	$\frac{1}{4}$ to $\frac{1}{2}$ grain.
Sodium bicarbonate (bak- ing soda),	10 to 30 grains.
Sodium, bromide of,	10 to 30 grains.
Sodium, salicylate of,	10 to 20 grains.
Sodium sulphate, Glaub- er's salts,	1 to 4 drams.
Squill, compound sirup of,	10 to 30 minims.
Squill, sirup of,	1 dram.
Sulphur,	1 to 3 drams.
Sweet spirit of niter,	$\frac{1}{2}$ dram.

Doses of Drugs

Turpentine, oil of,	5 to 30 minims.
Valerian, ammoniated tincture of,	$\frac{1}{2}$ to 2 drams.
Zinc sulphate (emetic),	10 to 30 grains.

Doses of Drugs for Babies One Year Old

In the table the drugs which are marked with a star are powerful and dangerous in large or in repeated doses.

¹ Aconite,* tincture of,	$\frac{1}{8}$ to $\frac{1}{4}$ minim.
Belladonna,* tincture of,	$\frac{1}{2}$ to 2 minims.
Bismuth, subnitrate of,	5 to 10 grains.
Brandy,	5 to 30 drops.
Bromide of potassium or sodium,	$\frac{1}{2}$ to 4 grains.
Calomel,	$\frac{1}{2}$ grain in single dose.
Castor oil,	$\frac{1}{2}$ to 1 dram.
¹ Chloral,*	$\frac{1}{2}$ to 2 grains.
Citrate of potash,	1 to 2 grains.
Cod-liver oil,	$\frac{1}{4}$ to 1 dram.
¹ Dover's powder,*	$\frac{1}{8}$ to $\frac{1}{2}$ grain.
Gin,	10 to 15 drops.
Ipecac, sirup or wine of,	1 to 5 minims.
Magnesia,	5 to 20 grains.
Magnesia citrate, solution of,	6 to 8 drams.
Niter, sweet spirit of,	2 to 6 minims.

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¹ Paregoric,*	3 to 10 minims.
Peppermint water,	$\frac{1}{2}$ to 1 dram.
Rhubarb, spiced sirup of,	$\frac{1}{4}$ to 1 dram.
Senna, sirup of,	10 to 15 minims.
Soda bicarbonate,	1 to 2 grains.
Squill, compound sirup of ("hive sirup"),	1 to 2 minims.
Squill, sirup of,	2 to 5 minims.
Whisky,	5 to 30 minims.
Wine, sherry and port,	$\frac{1}{2}$ teaspoonful.

RECIPES FOR THE SICK AND FOR BABIES

Beef Tea.—This preparation stimulates appetite, but contains very little food. Place one pound of scraped beef, free from fat, in an enameled saucepan, and pour half a pint of boiling water upon it; cover and put on back of stove for ten minutes. Strain into a teacup; place the cup in cold water and skim off fat from the beef tea when cold. Warm and season for use.

Veal, Beef, Chicken, or Mutton Broths.—The flesh of knuckle of veal, two pounds, or chopped chicken, bones and all, or two pounds of beef or neck of mutton, are added to one quart of water, boiled two hours and strained. Remove fat by skimming when cold. Rice, pearl barley, or vermicelli may be boiled separately and added to the broth with pepper and salt when the broth is heated for use, and increase the nutriment. Thicken-

¹ Caution. Dangerous. Use only on physician's prescription.

Recipes for the Sick and for Babies

ing with flour or cornstarch, cooling ten minutes, and adding three tablespoonfuls of cream or three-quarters of a cup of milk to half a pint of broth makes it much more nutritious.

Beef Juice.—This is more nutritious than beef tea. Slightly broil a piece of lean beef, from round or cheap part, and squeeze the juice out with a lemon squeezer, or meat press, sold by druggists. Serve cold, or but slightly warmed, with salt, but do not heat much or the value of the juice will be spoiled. One pound of beef will make six or more tablespoonfuls. One tablespoonful may be given at a time. If a meat press is not at hand, chop the broiled beef fine, add six ounces of water (one tumblerful), and stand on ice for six hours. Strain and squeeze through muslin or cheese cloth. By this method we secure a larger quantity of beef juice of a more nutritious quality. It will not keep more than a day.

Scraped Beef.—Scrape, grate, or mince a piece of raw steak very fine, pound it to a pulp in a mortar, and pass it through a fine sieve and flavor with salt. For babies, rub it with water till it becomes of the consistency of cream, and feed not more than a teaspoonful at a time.

Albumen or Egg Water.—For adults, strain the white of a fresh egg through cloth and add an equal quantity of water; flavor with a little lemon juice, or with brandy or whisky. For babies, stir the white of one egg into a cup of water and sweeten. It may be

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taken from a nursing bottle, and, with broths, may be used in place of milk for a time in infantile diarrhea, and when nothing else will be retained, in cases of vomiting. Barley water may be used to advantage instead of plain water, and adds to its value.

Clam Broth.—Place six large washed clams in their shells in a kettle with a cup of water, and boil one minute. Pour off the liquid and add one teaspoonful of bread crumbs, a little butter, and salt. This is an appetizing substitute for other broths for an adult.

Barley Water.—Stir one level tablespoonful of barley flour into a little cold water and add to one pint of boiling water. Boil twenty minutes in a double boiler, strain, and add enough boiling water to bring the quantity up to a pint. Whole barley may be used when one heaping tablespoonful is boiled slowly in a quart of water till it evaporates to one pint; it is then taken off and strained. A gruel of barley is made by using two tablespoonfuls of barley flour to the pint of water, and cooked in a double boiler.

Oatmeal Water.—Use one tablespoonful of ordinary oatmeal and add to one pint of boiling water, cook in double boiler for one hour, adding water as it evaporates. Strain and add enough water to make a pint. It may be used instead of barley water for infants, and is often beneficial in constipation. Rice, or wheat (common) flour may be cooked in the same way and used in place of barley water for infant feeding.

Recipes for the Sick and for Babies

Dextrinized Barley, Wheat, or Rice Water.—One of these is prepared as just described and allowed to cool to blood heat, when one teaspoonful of diastase (as Cereo or Forbes, obtainable of a druggist) is added, and, after standing for ten minutes, is used to make up one of the milk mixtures (Vol. III, p. 129). The diastase serves partially to digest the barley or other flour, and therefore this method is valuable for infants with feeble digestion.

Peptonized Milk.—This is very useful for babies who cannot digest plain milk, even diluted as ordered in the receipts for milk mixtures, and who vomit and pass curds from the bowels. For adults, it may be employed in acute indigestion when little is retained in the stomach. Fairchild's peptonizing powders are used, as sold in little glass tubes. The contents of one of these is first rubbed up with a little milk in a tablespoon and then added to one pint of plain milk in a glass jar. The jar is placed in basin of water as hot as the hand can bear, and left to stand there for ten to twenty minutes. If the milk is not to be used at once, it should be then brought quickly to a boil or placed immediately upon ice. When the milk mixture for infants is to be peptonized, the soda should be omitted from the milk, as it is contained in the peptonizing powder. One-sixth of the contents of each little glass bottle containing the peptonizing powder should be mixed with a little cold water in a teaspoon, and added to each bottle of milk just before the time

for feeding the baby. Then the bottle is heated to blood heat, as usual, but the powder is allowed to remain in the milk mixture ten minutes before the bottle is given to the baby. The powder partially digests the milk, and if it remains in warm milk more than fifteen or twenty minutes the milk acquires a bitter taste, which is not unwholesome, but may cause the baby to refuse it. Such milk should not be fed to infants longer than two or three months, but is often very useful for infants with weak digestion during the early months, and at any time during an attack of acute indigestion.

Whey.—Warm one pint of fresh cow's milk to blood heat, add pinch of salt, one teaspoonful of sugar, and two teaspoonfuls of liquid rennet (or half a rennet tablet dissolved in water, or two teaspoonfuls of essence of pepsin). Allow to stand till a complete curd forms, then beat up the curd with a fork and strain the liquid, or whey, through muslin. If the curds are well beaten the whey is much richer in fat, and more nutritious.

Follow the directions on the rennet bottles as the different varieties vary in strength. Whey is serviceable for feeding a baby for a few days during an attack of vomiting and indigestion, and in fevers. To make it more nourishing, stir the white of one egg into a tumbler of whey. A pint of milk makes half a pint or more of whey.

Whey Mixtures.—These are very useful in feeding, for the first two or three months, delicate babies who

Recipes for the Sick and for Babies

cannot digest the ordinary milk mixtures. In preparing the mixture, three ounces of top milk, such as is used in Table II (Vol. III, p. 122) are added to eighteen ounces of whey and two tablespoonfuls of milk sugar. The whey should, however, be first heated to 155° F., or as described for killing the germs in milk, before it is mixed with the cream, otherwise it will curdle the cream. Gradually the cream is increased to five ounces, and the whey to twenty ounces. This quantity is prepared for twenty-four hours, and the amount given at each feeding is that suitable for any milk mixture, according to the age of the child. The whey may be made from the under milk from which the top milk has been removed.

Junket or Milk Curd.—This is made as directed for the preparation of whey, only that in this case the curds are not beaten to separate the whey, but are eaten as prepared, usually with grated nutmeg and sugar. A whole egg beaten to a froth with two teaspoonfuls of sugar may be added to the milk, and stirred in before the addition of the rennet. This increases the nutritive value of the curd. Junket is a pleasant article of food for an adult with weak digestion or fever, and is used as a regular addition to the diet of infants over a year old.

Wine Whey.—Add one wineglassful of sherry to half a pint of boiling milk and strain, preserving the liquid for use.

Soft-boiled Eggs.—Place the eggs in enough boil-

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ing water to cover them, and then remove the saucepan to the back of the stove where the water will remain hot, but will not boil, for eight minutes. By this method, which is the only proper one, the white of the egg will be cooked uniformly with the yolk, and have a soft, jellylike consistence, which renders it more digestible and palatable than by the common mode of cooking. Eggs for children should always be prepared in this manner.

Malt Soup.—This preparation is very valuable for feeding babies who are wasting away, owing to inability to digest and assimilate ordinary food. Mix four level tablespoonfuls of flour with a little milk into a paste, and then stir it into three cupfuls of milk. Into another dish put one and one-quarter pints of water, to which add two-thirds of a cup of malt extract (the thick fluid variety), and dissolve at a temperature which the finger will just bear, and add a quarter of a teaspoonful of baking soda. Mix the latter solution with the milk and boil.

Oyster Broth.—Mince one pint of small oysters and add to half a pint of cold water. Simmer for ten minutes, skim, strain, and serve with pepper and salt. This is a similar preparation to clam broth, and is a palatable food for adults with acute indigestion or fever.

Milk Porridge or Thickened Milk.—Stir one tablespoonful of flour into a paste with a little cold milk, and then add while stirring to half a pint of boiling

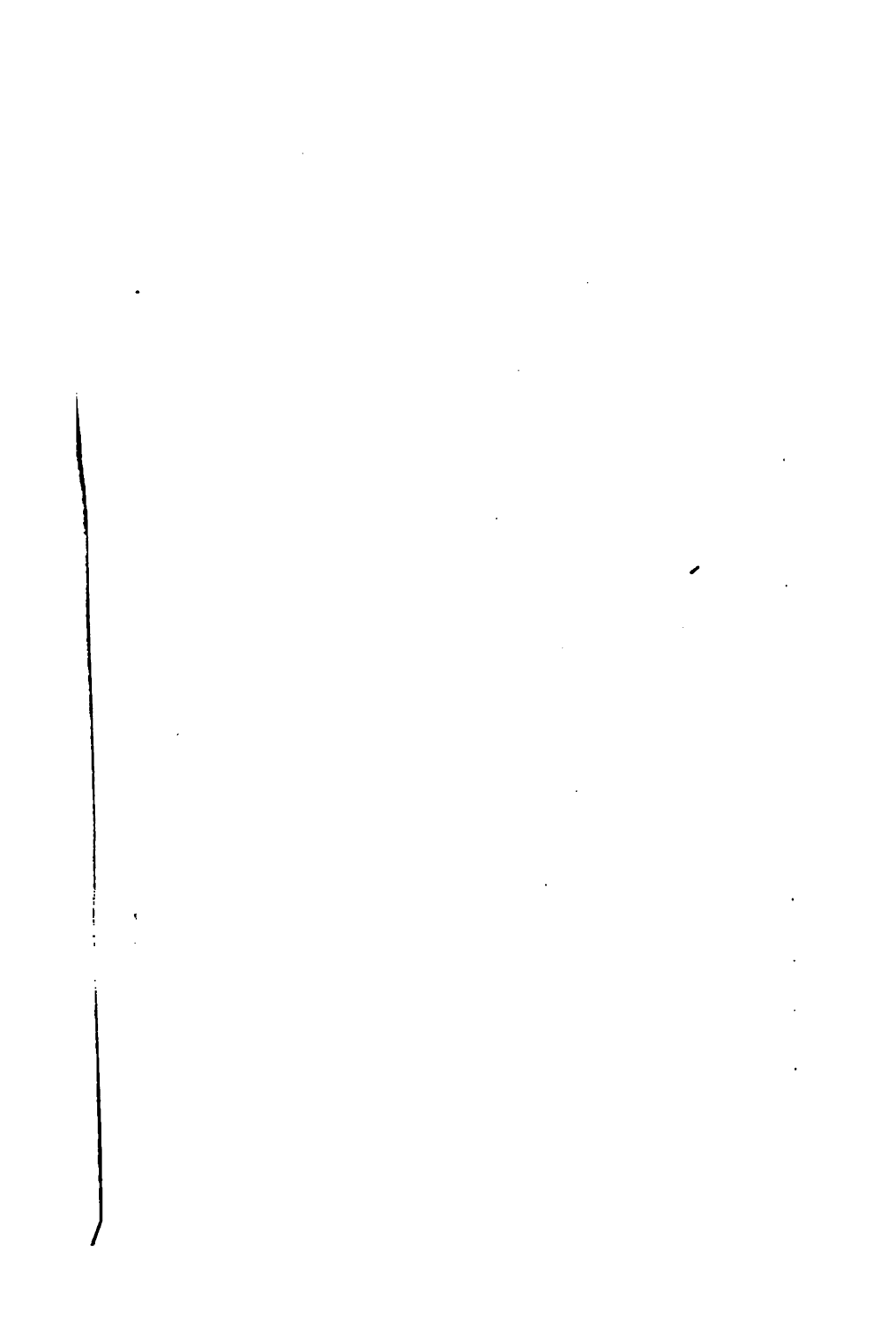
Recipes for the Sick and for Babies

milk. This is very useful for older children and adults with diarrhea.

Eggnog.—Scald some milk, but do not allow it to boil. Beat up the white of an egg to a stiff froth and add the yolk, a little sugar, and two teaspoonfuls of brandy, sherry, or rum. Stir the egg into a glass of the milk when it has cooled. Persons tire of this quickly, owing to the richness of the yolk of egg. For most invalids, it is better to use only the white of egg, stirring it into the milk after it is beaten to a froth, or simply shaking the raw white of egg into the milk in a bottle, and adding the stimulant and sugar or salt.

Limewater.—Place a piece of unslaked- or quick-lime, as large as an egg, into one gallon of water in an earthen jar or demijohn. Shake or stir and let settle; then pour away the water and add fresh water. Keep covered, and after standing for a time use limewater by pouring off the top. From time to time add water and stir. Water will dissolve only a minute quantity of lime, but after a while the lime in the top of the water becomes chemically changed and useless, so that it should be poured from the top and fresh water added.

Other Foods.—Such articles as milk toast, oyster stew, soft custard, wine jelly, and cocoa, are excellent for persons suffering from digestive weakness or fevers, but it seems unnecessary to describe such ordinary dishes, for their mode of preparation may be found in any cook book.



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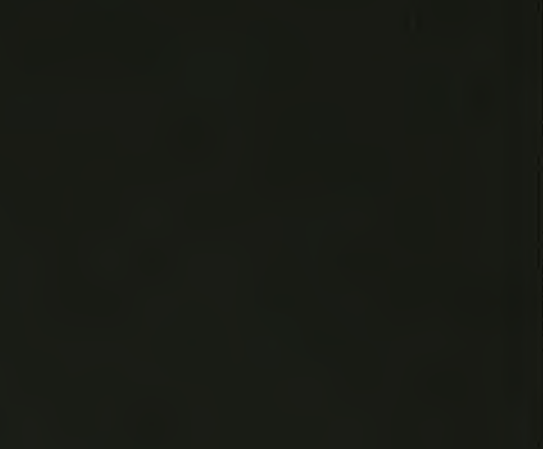
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